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ASPECTS OF THE PSYCHOLOGY OF GAMES AND SPORTS[1]

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I. INTRODUCTION

THE psychology of games and sports is a subject of very great interest, which has been dealt with by a number of writers, but which has never received the treatment it deserves at the hands of social psychologists. It has been treated by psychologists chiefly from the points of view of the psychology of morals and of education, and as a branch of the study of play. Group games and sports, however, have a very special interest for the social psychologist in a variety of ways, and it is the purpose of this article to point out some of these ways in a simple manner, though of course they cannot be dealt with fully here.

The whole subject can be profitably approached from three points of view: (*a*) the study of the individual and of his attitudes and interests and of the gratifications he receives from sports; (*b*) the study of the groups involved and represented in sports, and of their animosities and friendly feelings towards each other; (*c*) the study of the influence of tradition and of the social background upon all groups and individuals concerned in games and sports.

These three aspects are not strictly separate, but are interwoven in a

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variety of ways and will not be treated separately here. The individual it is who takes part in sports and games, but always in a social way—and, from the psychologist's point of view, it is still a social interest on his part even if he exhibits anti-social behaviour, because to be anti-social is simply one kind of social response. The number of games which can be played by individuals alone, like patience and golf, is small, and in them it is usually assumed that there is an imaginary opponent. In golf 'bogey' is a sort of standard imaginary opponent, who is available for any player who cannot find a playmate in flesh and blood. Indeed, in psychology, we should be inclined to say that absolutely non-social sports are almost unknown. It is perhaps necessary to say 'almost', but the word is introduced chiefly to guard against the possibility of appearing unduly dogmatic. When an animal, a child or adult plays with any objects, animate or inanimate, with objects of imagination or with himself, he is really using these objects as substitutes for the inner and often unconscious objects of his own fantasy life, and these seem always to have social meaning of some kind. Thus solitary play often has much social significance to the individual, but in the study of group games and sports we must take serious account of the degree to which such games tend to bring individuals together and make them co-operate in joint constructive efforts. In this way group games like cricket and football seem to do most, and the solitary games least, and the group games have rightly become important parts of public life. It would be silly to take an excessively practical-minded point of view, and to say that these group games are a waste of time which should be put to 'real' use. To the psychologist they are obviously a most important part of everyday life.

Before discussing the psychology of group games it would be interesting to describe a cricket match in which I recently took part. There was some time to spare on the annual outing of the staff of a small factory. They were at a convenient village green in the New Forest, with houses on one side and gorse bushes on the other. Soon cricket bats, wickets, bails and a ball were produced out of a bag, and the green became—once again in its history—a cricket pitch. Sides were rapidly chosen, and soon a match was in progress between the 'English' and the 'Australians'. Everybody took part in this game, even the coach driver, and their ages ranged from fifteen to seventy-five, while their occupations varied from office boy to managing director. It was assumed that everybody could play cricket, and one woman, who had never before handled a bat, triumphantly carried it off the field, not out, when her side retired. The pitch was sporting to say the least of it, and doubts about the direction

in which a ball would bounce added to the fun. There were houses across the road near by, but it was understood that the object of play was to have a good game and not to break windows, so batsmen avoided hitting the ball in that direction. Once, however, when it did go into the road, it landed in a passing motor car, and the occupants good-humouredly returned it. Probably they wished they were playing cricket too. Sometimes the ball was lost in the gorse, but then everybody joined in the search. Some of the fielders had to keep out of danger three cows, some geese and two dogs who regarded the green as belonging to them exclusively. A game of this kind has strong claims to be called the 'real' cricket, and, in its socially constructive and fraternal qualities, and in its good-humour, it illustrates the fundamental aspects of group games.

II. CONSTRUCTIVE USE OF AGGRESSION

In social psychology we cannot suppose that there is any possibility of producing an idealistically moral individual. This is an illusion of the schoolmaster, the parson and the moral philosopher. The psychologist is an uncompromising realist. He knows that the solution of moral problems lies ultimately in the production of harmoniously developed individuals and of harmoniously organized groups, but he does not think this solution can be found by idealistic purifications. He thinks, on the contrary, that a harmonious society will have to find some definite satisfactions for the individual's aggressive, destructive and sexual impulses. It will have to recognize the existence of these impulses in man, and to find a place for them in its culture and social order. It is of no use to think of these impulses as dirty, dangerous or immoral: they must be viewed with simple acceptance as normal to our existence. The problem before the social psychologist is to find a place for aggression and destruction in which they will not conflict with the harmony of individual and society. To do this it may be necessary to have a complete moral revolution in the end, but social and individual harmonies will not be found by idealistic purifications.

One of the greatest interests of group games and sports to the social psychologist lies in their capacity to sublimate individual and group aggression. By this we mean simply that they find outlets for impulses which might endanger the harmony of social groups, and that they allow individuals to express, in a constructive way, impulses which might otherwise be socially repressed and prohibited. We may say that group games have what Aristotle called a cathartic action in connexion with

tragedy. We must, however, not be content with thinking that games are simply outlets for unwanted energy. That mistake is too often made, just as some people are inclined to defend or excuse prostitution as an outlet for unwanted sexual energy. This is not a sound psychological explanation or excuse for prostitution, however, because the love represented by this sexual energy is very much wanted, and prostitution exists because, for a variety of complex psychological reasons, the people who want it cannot get it. We must look on the aggression which finds outlet in group games as decidedly wanted by society, and one great interest of these games is that this energy is used in them in socially constructive ways. It has given us, for instance, the world-wide organization of Association Football—an addition to human social life of very great value and importance. This is to be contrasted with some other ways in which aggressive energy is used, such as competitive trade and warfare. In these, though the resulting social organizations are useful to some groups, they tend to set up conflict with other groups in a dangerous and destructive rivalry, whereas in group games we are friends, not enemies, because we compete. Group games cannot of themselves do all the social psychologist asks, and we must not make the mistake of being converted to a single faith which we believe to hold the solution of all possible problems; but such games are of great interest because they show us the constructive use of aggressive and destructive impulses in group and individual.

III. Meanings of games to the individual

We may turn now to some more detailed meanings of group games to the individual. Some sports, like wrestling and boxing, are not dependent on special weapons apart from the individual's limbs and fists, and in most games to-day we do not kill our opponents, though in past times this has frequently occurred, as in jousting. In some sports, such as shooting, we are given dangerous weapons in addition to our limbs and fists; and in fishing, hunting and shooting we are expected to kill and even sometimes to eat the trout, stag, pheasant or other enemy creature. In chess and card games we play with symbolic men rather than with weapons, and allow them symbolic deaths and forms of conventionalized capture. There is great variety in all these ways in games and sports, and there can be little doubt that a given individual tends to excel in the game or games which fulfil the particular requirements for gratification of his own special fantasies and attitudes to the greatest degree. It is the same in the plastic arts and music. Dabbling with water-colours suits one

person, smearing oils another; manipulating clay or hammering stone suits a third. One musician likes to nip the reed of the oboe, another likes to blow into the flute; a third prefers to pound the piano or to whine on the saxophone.

We cannot believe that games and sports, in all their varieties, have been deliberately planned, according to intellectual and rational rules. They have grown up and varied from each other because different individuals needed different forms of gratification in play, and imaginations tended to construct games which would satisfy them. For example, in golf and cricket the ball is struck with a club or bat. I often point out to my students that the teed ball, whose head is so skilfully and violently cut off with the driver, may be unconsciously much more than a mere ball to the golfer. It is in one of its aspects a kind of enemy. Sometimes it seems to represent his office boy, his employer or even his wife or mother-in-law. When he is particularly savage and hits it so that he breaks his club and spoils his game, we suspect that it represents himself. A man to whom the ball always tends to represent his own person being punished by himself will never be a success at golf.

In football we have the same sort of problem. The 'rugger' player seems to have an especial liking for the ball, and wants very much to have the satisfaction of hugging it and possessing it to the exclusion of the enemy. Handling the ball is evidently one of the great joys of the game. On the other hand, in 'soccer', the player seems afraid that he will dirty or endanger himself by touching the ball with his hands. It is strictly taboo to touch the ball when it is alive or in play. Only privileged persons, the goalkeepers, are allowed to touch it, and then under special conditions, without being said to commit a foul act. To the psychologist it seems that the rules and prohibitions of these games have developed in order to enable the individual to do what his unconscious impulses demand of him. If a man has strong likings for possessing and hugging a ball-shaped object, he is more likely to fall in love with 'rugger'; if he has unconscious fears of ball-like objects, and intense desires to spurn them with his feet or to use them as weapons of attack, he may fall in love with 'soccer'. It is not likely that handlers and non-handlers will ever be satisfied with a compromise, because the unconscious meanings of the ball are too widely different for them. They are not playing out the same fantasy game: their unconscious fantasies are as different as those of communists and fascists, though their methods may be similar.

It seems, then, that there must be a wide variety of games, as wide a variety as there are differences between the deep fantasies expressed in

play by a great variety of people, and to decry one game or praise another is often to do no more than to fight over unconscious preferences which are as real in one person as in another. Each person should be encouraged to choose the game most suited to him. It is a mistake for a school to play 'rugger' and to despise 'soccer'. All schools should play both games, and there should be no social credit attached to one and denied to the other.

To the individual who is playing a game, the opponent, the ball, the club or bat if used, the goal, the field of play and the members of his own side, are all symbolic actors, animate or inanimate, in his unconscious fantasies, and his gratifications are found in manipulating, controlling and acting with or against them. They are like the members of an orchestra to the conductor, who summons with his baton first one and then another of these devils or angels of his fantasies to play his part in the music which he is interpreting. It is often said that competition is the essence of sports and games; but it is no more fundamental to them than to life in general. The particularly interesting feature of games is their capacity to make friends rather than enemies out of opponents and rivals.

IV. Territorial interests of games

If we turn from the gratifications of the individual to the interests of the group, the first and most obvious feature of games like football is their territorial meaning. Territorial interests are widespread and deeply rooted in the lives of members of the animal kingdom (1). A large number of different kinds of birds and mammals tend to seize territory, either in pairs or in groups, and to put it to use for nesting and hunting purposes. Since many creatures, from fish to apes, are biologically dependent for food and shelter on the possession of territory, it is not surprising that possessive attitudes to territory are strongly expressed in their instinctive tendencies. In Glasgow I knew a pair of brown owls which inhabited a small fir tree for years, and it was said that they had lived there for twenty years at least. It was a sunny place in a secluded garden, where they found shelter from the North and East winds and could not easily be seen. It gave them command over the food supplies of the neighbouring gardens at night. In man possessive attitudes to territory are also strongly expressed. Most people will feel it strange when they hear of land which is not owned by somebody, and, in the days when mariners could still find lands apparently not owned by members of their own peoples, they usually took immediate possession of them. Our laws provide

elaborate systems for the ownership and partition of property, and land is one of the most significant emotionally, though not always the most valuable in money terms, among the different kinds of property.

To the psychologist the sight of two teams of footballers fighting a symbolical battle over the respective halves of a football ground is like a fight for the possession of territory. The game is to enter the opponents' country and to carry or to kick or head the ball, which is the weapon and the symbol of potency and mastery, right into their goal, which is like the very doorway of their stronghold. The side which can do this most often in the prescribed time and under the prescribed rules and laws of play is the winner—they have conquered the opponents' territory. The great importance of the off-side problem in 'soccer' emphasizes the territorial aspects of the game, because it is a problem about how and when a player can be said to have an unfair territorial advantage. The same kind of territorial symbolism finds its way also into other games, such as golf, where the player who can lodge his ball in the final hole, after making it take the smaller number of leaps across the intervening territory, is the winner. It is also found in cricket, where the enemy is sent chasing the symbol of potency across the field, while the batsmen run for possession of territory as often as they can from one wicket to the other.

The influence of territorial combat, especially in 'soccer', is reflected in the vast interest of international contests. When England plays Scotland it is like one of the historical battles fought over again, and it is often found that the home team is the more inspired, defending its own soil, and more often wins. Territorial ideas spread to the audience too, and in the great Glasgow grounds, for instance, Hampden, Ibrox or Parkhead, it makes a difference if one has found one's way into the wrong side of the auditorium, and falls into the hands of the enemy. Two friends of mine made this mistake one afternoon at Parkhead and, when they saw another man who had made the same mistake being helped out by the police, they kept very quiet. It must be said that social psychologists look upon the spread of organized international sports and games with the greatest possible satisfaction. They believe that a very large number of human territorial and other battles could be fought out harmlessly and constructively in the form of games.

V. Fair play and *morale*

From this brief discussion of the less conventional aspects of the psychology of games, we must turn to the problems of fair play. These problems may be put in the following form: the individual, who is known to the psychologist to have intense aggressive and destructive as well as friendly and comradely impulses, is able to forego the pleasure of killing and maiming his opponents, and generally tries to avoid hurting them altogether, while he retains a keen interest in competition with them. He also sinks his own individual self-seeking tendencies to a great extent in supporting the interests of his side or team, and members of both teams, opponents though they are, co-operate to give the audience a good game to watch and enjoy. This remarkable degree of co-operation is perhaps found in group games more than anywhere else. It is not the result of deliberate or rational intentions. On the contrary, the rules and regulations were invented because they fulfilled a public desire for constructive games, and by itself no amount of pure moralizing could make a very anti-social person take a co-operative part in group games. It is necessary for him to come to feel the impulses of fair play for himself, and these do not arise from conscious moral endeavour. Underlying this is the same essential principle which makes occupational therapy so important in psychiatry.

The impulses of fair play seem to be fundamental to games and sports. Even in grouse shooting most sportsmen feel a certain desire to give the birds a fair chance; they want the hunt to be something like a fair rivalry and not a mere slaughter. In organized group games the players and the audience must all feel these impulses, (*a*) of fairness to the opponent and (*b*) of co-operation with their own side, very strongly, or else no amount of authority could ensure the success of games. For example, The Football Association Rules and Laws, and the capacity of the Association to enforce them, are both no more than the indirect expressions of public desire for fair games. The players and the public do not always get fair play, of course, but the desire for it is strong enough to make it the rule rather than the exception.

Fair play, *morale* and *esprit de corps* are inner controlling tendencies in the individual, which arise from his loyalty to group and leader, and make him reluctant to release his aggressive and destructive impulses to their full extent. In their place we find the skill of the athlete and his readiness to give up individual mastery and to take an interest in the group he represents, and even to treat the opponent as a friend. Fair

play is probably to be regarded as made up of a combination in the individual of (*a*) comradely feelings towards other people, (*b*) strong unconscious tendencies to compensate for aggressive impulses which are also excited by his relations to others, and (*c*) each individual's own desire not to earn the hatred of the others by being the first to give way to those same aggressive impulses. It is this particular combination of tendencies which gives fair play its capacity to make group games into constructive outlets for aggression. It cannot be achieved by conscious moral effort, but only by more or less unconscious acceptance of group influences, which include even a sort of emotional identification with the opponent which prevents the combat sinking to a brutal level. It is probable that this capacity for fellow-feeling with an opponent is a very important aspect of human social psychology.

The psychology of fair play and the *morale* of group games have been clearly discussed by other writers (2, 6). Fair play seems to depend to a very large extent on impulses of comradeship which are deeply rooted in human nature. They are different from assertive and submissive impulses, and may, as Suttie has pointed out (9), be fundamental in all harmonious human relationships. They do not find expression very freely in our aggressive and competitive cultural environment. The *morale* of group games depends on submission of individuals in a team to leadership and to the purpose of the group apart from that of any individual taken singly. It is not a 'moral' or 'voluntary' submission, but comes from the formation of a new social pattern in the group, of which the individuals are components, but which is more than the sum of their independent wills. In the same way, two opposed teams which play well tend to form an even larger unit, and are, as pointed out by Rimet (8), more than mere opponents.

In group games, however, aggressive and acquisitive impulses, and sexual rivalry, are very strongly excited and find expression and satisfaction. The strength of these impulses is shown in outbursts of animosity between rival crowds of football enthusiasts, in violent expressions of support for their side by onlookers and their rude assertions of what they would do to their opponents if they had the chance, and also by the occurrence of 'accidents' which may often be unconsciously motivated when not due to deliberate foul play. The individual seeks expression of these impulses, but is, in general, consciously or unconsciously afraid of their strength and violence in himself. He therefore seeks more or less wittingly also for group-control and self-mastery. Another impulse, which strongly influences the behaviour of the individual member of a

group which is held together largely by *morale* and *esprit de corps* is the fear of being the first to incur the hatred of the other members by an open expression of the tendency against which all are striving in the group. Here the anger of the other members would be incurred by open aggression against the symbolic enemy—the other team. In many groups, especially in war-time, panic is the tendency which is taboo and which would incur anger if expressed (cf. Rickman (7), p. 372). It is the combination of comradeship, and of loyalty to the group and leader, with the double desire for both expression and control of violent impulses in the individual, which gives rise to the impulses of fair play and the *morale* of group games. Fair play is an unconscious recompense to opponents for the aggression and sexual rivalry, and for the acquisitive impulses which a player feels in himself to be latent but directed against them in competitive games.[1] It strongly reinforces the original feelings of comradeship. The historical account (5) shows that the impulses of fair play have had a tremendous influence on the history and development of Association Football.

VI. Professionalism and betting

It is interesting to consider the relationships of professionalism and of betting to the fair play of games and sports, because both have sometimes been accused of threatening it. We have been told that a man cannot adopt the professional attitude and also continue to take part in games with the freedom from the influence of ulterior motives which they demand; and that an enthusiasm for betting may also provide incentives which would sometimes upset the sportsman's *morale* and *esprit de corps*.

In the Church a minister is generally expected to give his best service, and wants to do this himself. A man cannot easily give his best time and energy to the Church and earn a living elsewhere. Consequently for the most part ministers have to be professionals. For the same reason artists, musicians, athletes, psychologists and a host of other people have to be professionals too. In fact, everybody ought to be a professional at his particular job, but this should be no reason why a man who wishes should not also be a non-professional at other jobs. The difficulty is that the non-professional can never expect to reach the level of attainment reached by the professional, and this should not be expected of him. It is fair to expect every individual to wish to take up some occupation

[1] In the same way politeness in everyday life is often a more or less unconscious cover for hatred or jealousy; and the perfection of beauty traditionally demanded in works of art is often an unconscious recompense or restitution for aggressive and destructive impulses felt towards the objects drawn or symbolized (4).

which will seem worth while to him because it satisfies his particular interests and utilizes his gifts, and which will at the same time make him self-supporting in the community. It is as sensible for a footballer as for a parson to be a professional. In athletics difficult problems will always centre about the definitions of amateur and professional status, and about the formulation and interpretation of rules and regulations connected with these definitions.

With regard to betting there are greater difficulties. A man does not take up betting in order to make himself self-supporting in the community, unless he becomes a bookmaker. The psychologist, on the whole, thinks of the interest in gambling and betting as symptomatic of frustrations resulting from various complicated aspects of social life. It is a different question to what extent these interests are to be regarded as morbid or as normal, and a further difficult question how far they are essential to games and sports. In the more morbid forms of betting the bettor seems to be playing with the chances that he will receive a gift from fate which will suddenly compensate him for frustrations and losses which he feels, rightly or wrongly, that he has sustained at the hands of his family and fellow-men. Sometimes this may be a pathological obsession; at other times it tends to be disguised under other names and becomes his business. It is usually not merely an interest in trying to support oneself in the world, but to get more than anybody else. In its more normal forms betting is simply a way in which people add a little zest to life, with more interest in the emotional thrill than in the fantasied gifts of compensation. For the most part the football pools seem to have been a mild form of family amusement and, under existing circumstances, betting can hardly be a reason why people organize, play or go to see football matches. If it were systematically organized on the grounds, however, unless this were done with great care, its influence might be different.

Some people may think these interpretations of betting unduly hard, and I am the last person who wants to use psychology in looking after morals which refuse to look after themselves. On the morning of writing this article, however, I received a notice from a big firm of bookmakers, inviting me to open what they called a 'credit' account, which is a polite way of saying 'debit' account. Their chief line of attempted appeal to the reader of the notice took the following form: "*Right through the Card!* The dream of every enthusiastic backer, but a dream which came true for one of our clients, who went 'right through the card' at Ayr and received from us payment at more than £1000 to £1."

It seems unlikely that the conventional moralist will have any more capacity to control betting than he has to prevent people having dreams. At the same time betting is, at least in the present state of social life, often a normal form of excitement to many people, but its relevance to group games is open to serious doubt. The development of football betting was probably regrettable, and it enabled many people unofficially to exploit the game for private interest—though we might object to the Press on the same ground. Active resistance by the football authorities to organized betting on the field of play or within the gates of the ground itself, however, is likely to meet with continued public approval, because betting fails to accord with the real inspiration of the game. It may accord better with the inspiration of card games, which are largely based on chance, and with that of racing, but this may be a different question, because the whole psychology of these games and sports may be different from that of group games which are chiefly based on co-operative skill and team work.

VII. Class and sex distinctions

A very interesting group of problems about the psychology of sports is connected with the social class and sex distinctions expressed in them. The Rugby and Association games were, as shown in a previous paper(5), both derived from the common background of ancient and medieval football, sometimes played by whole villages. When football began to be played in the public schools, in the early part of last century, there was a tendency to reduce its violence and also to make a contrast between the dribbling type of game, then characteristic of Eton, and the handling game which became traditional at Rugby. When the Cambridge Rules were formulated in 1848, the two forms of football as we know them were not distinguished, though handling the ball was very much restricted for those who accepted the rules. All attempts to compromise between the handlers and the dribblers failed in 1863, however, when The Football Association was formed. Then the followers of the Rugby tradition finally withdrew, and later they formed the Rugby Union.

Since this division Rugby Football has tended gradually to replace Association Football as the gentleman's game, and this was partly due to the great developments of professional 'soccer'. Perhaps it was due to the earlier development of organized Association Football, which grew very rapidly in popularity and left the exclusive position to the Rugby enthusiasts. Association Football has become the people's game, and Rugby the game of the more select. It is of great psychological interest

that these games have diverged in social meaning, and there are many related problems, which cannot be discussed or solved here. For instance, Rugby Football might be described as less restrained and more violent than the Association game, which is more restricted and controlled and is more removed from the medieval "hustlings over large balls", which were many times officially, though not very successfully, prohibited by law. Do the 'upper classes' traditionally prefer violent and warlike play, and the 'lower classes' traditionally submit to control and accept restraints? Are the 'handling' and 'tackling' so characteristic of Rugby symbolic equivalents of 'man-handling', and is the taboo on touching the ball (the symbol of potency) in Association Football the expression of a traditional fear of authority and control?

Other games besides these two forms of football reflect and express social and class distinctions, and the history of games like golf taken from this point of view would be most interesting. It is also true that many games express sex distinctions. We shall be told that football is not suited to the gentler sex; but are they indeed gentler, and why has it not been adapted to suit them? A gentler six-men game has recently been evolved out of American Regulation Football(3). Golf and tennis have been developed to suit women, and tennis is not particularly gentle. Football has not always been a man's game. At Scone the traditional Shrovetide game of football was between the bachelors and married men; but in Midlothian and at Inverness it was between the single and married women. In football, as we know it, the men fight masculine rivals, and they do not want the interference of women. At golf or tennis, however, we may fight rivals of either sex, and so games in general may be regarded as having developed to express certain underlying sex attitudes and rivalries, which may or may not be more than popular ideas about the differences of the sexes. From what we see of women it appears that they might be quite good at boxing and wrestling if tradition permitted them to try, and the techniques of combat had been adapted to suit them. I can imagine a good many women enjoying the sight of their female rivals' noses bleeding; but these sports have been captured by men as their province, and have evolved so that they now seem necessarily to exclude women.

VIII. SUMMARY AND CONCLUSIONS

If we examine group games from the point of view of the individual and the gratifications he receives in them, we find it is of outstanding importance that they lead him to a constructive use of his aggressive

impulses. More from the point of view of the group itself, we find that these aggressive impulses are largely sublimated in the form of constructive territorial combat. Football in general seems to be an expression of impulses towards combat for possession of territory, which are very deeply rooted in animals and in man.

In a particular game, such as Association Football, certain tendencies and taboos are developed, and the game appeals to persons in whom those tendencies seek gratification. Thus the importance of footwork with a taboo on touching the ball in the Association game, compared with the importance of holding and running with the ball in Rugby, and other differences, may be understood. The individual's fantasy life finds expression in innumerable ways in the games which he chooses to play, and he is not likely to be a success at games which fail to satisfy his particular unconscious fantasies.

The *morale* and fair play of group games are due to the impulses of comradeship, to the development of loyalty to the team and leader, and to the tendencies to counterbalance violent expression of aggressive, acquisitive and other impulses in the individual, of which he is usually afraid in himself, by group control. The game allows expression of violent tendencies, but satisfies the individual's anxieties about his own aggressiveness by the development of fair play. *Morale* and fair play are psychological modes of control which have little to do with conscious and conventional morality in origin, but which are of immense social importance and which arise spontaneously from the essential nature of group games and sports.

Professionalism is not psychologically objectionable—quite the contrary; but betting appears to be out of accord with the fundamental interest of group games. Such games often express and represent social class differences and popular attitudes to sex differences, and would repay historical study by the social psychologist. The underlying impulses of group games are democratic in essence, and the world-wide popularity of such games as Association Football indicates the real value of these impulses in human social life, though it may often be obscured in political situations and problems.

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THE RELATIONSHIP OF OCCUPATION TO PERSONALITY

By M. D. VERNON

From the Cambridge Psychological Laboratory

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References (p. 326).

I. Introduction

In two previous papers(1, 2) the author advanced the argument that the individual's choice of a career or occupation in life is to a great extent determined by the main 'drives'[1] which are fundamental to the motivational side of his personality. Further study of the problem, described in this paper, seems to show that this determination is particularly clear in the case of those whose career is to them a matter of major importance in life. It is therefore possible to study these drives, the basic dynamic tendencies of the personality, by investigating the manner in which such people have chosen their occupation. Of course not everyone feels his occupation to be an important and essential function of his personality. In such cases we should not expect to find that the occupation would afford a direct expression of the fundamental drives. Though no hard and fast line can be drawn between the two types of individual, it is easy to distinguish the cases which lie at either end of the scale.

Some description of the main drives which seem to determine the choice of a career, and of their method of functioning, has already been given in relation to the interests and vocational wishes of school girls(2) and University students(1). It seemed probable that in these children

[1] A definition of the word 'drive' is given in (1).

and young adults the main drives were not as fully formed or as well defined as in older people. Moreover, since the final structure of the personality had not been fully formed in the younger persons, the relations of drives to each other—their relative dominance, their combinations and conflicts—had not been as fully established as in the more mature individual. Consequently it was decided to make a further study of those who had already entered some form of regular occupation and had been employed in it over a certain period of time, with a view to observing the operation of their drives in what they remembered of their reasons for their original choice of a career or occupation; for any subsequent change of occupation; for any wishes for a change; and in their attitude to their work and their interest in it.

For many reasons, it seemed desirable to continue studying the choices and drives of women. A few men were also interviewed, and the author hoped to make a corresponding study of men, but circumstances made this impossible. From the studies of the men interviewed, it appeared probable that the actual drives determining the choice of a career were very similar in men and in women; but that they might be stronger and more clearly marked in the former than in the latter. Indeed, it is possible that for social reasons a man's career is a much more important function of his personality than is a woman's. To many women, situations connected with personal relations, marriage, the home, etc., may be more closely linked to their fundamental drives and essential desires than are situations arising in the course of their daily work. On the other hand, the observations described in this paper, and the information about women factory workers given in a recent paper by Jahoda (3), seem to show that women in professional occupations are more prone to identify themselves with their satisfaction and achievement in their careers than are women in non-professional occupations. That is to say, the former feel their occupations to be integral parts of themselves and essential features of their lives; upon them are centred their hopes and fears; success brings a feeling of personal achievement, and failure a set-back to their potentialities—quite apart from its effect on their economic security. In particular, their occupations afford means of expressing their main drives, which provide the force that energizes and directs their work in these occupations.

Since the majority of women studied were engaged in professional occupations, we have plenty of instances of this 'identification'.[1] Some

[1] This process should not be confounded with the Freudian identification, to which its relationship is unknown.

examples also occurred among women in non-professional occupations; but the sample was too small to give an accurate measure of their frequency.

II. Description of investigation

To describe in more detail the groups of women studied: There were thirty-nine (unmarried) women who had had a University education; thirty-six of these were in professional occupations[1] (or had recently retired from them); two were doing secretarial work, one unpaid social work. In addition there were fourteen (unmarried) women who had had secondary school but not University education; of these four were in professional occupations,[1] two were gardeners, and the remainder were in secretarial or commercial occupations. These women were all interviewed singly by the author. No rigid scheme of interview was employed. In general the subject was asked to describe what ideas she had about jobs when she first started to think about a career; what she remembered of her reasons for entering a particular occupation (or occupations, when she had changed from one to another); how she had progressed in that occupation, and how much it interested and satisfied her; and if she had ever contemplated changing or decided to change it. Supplementary questions were asked to elucidate these points.

In addition, a further study was made of eighteen women (five married, thirteen unmarried) who were applying at an Employment Bureau for jobs. Of these, six had had a University education, the remainder secondary school education. Four were or had been in professional occupations,[1] the remainder were or had been in secretarial or commercial occupations, or doing some kind of non-professional social work. These women were interviewed by the personnel of the Employment Bureau, but the author was able to record verbatim the answers of the applicants, which were often illuminating, and gave additional information on various points.

III. Some important personality qualities

It is necessary first to consider the type of drive which operates in determining the choice of a career, and in maintaining the ability to carry on that occupation with a reasonable degree of success and satisfaction. The drives which seemed to be of the greatest importance in

[1] These included: teaching (University, school and training college), medicine, nursing, research work (University and industrial), librarianship, social work (mental health), accountancy. The majority were teachers.

these respects were described in the two previous papers(1, 2). They were listed as follows:

Security. The drive towards self-maintenance and self-preservation, particularly towards achieving economic security.

Pleasure. The drive towards obtaining rest and relaxation, and also variety and amusement; the nature of this drive was somewhat diffuse, but it was best characterized by the phrase 'wanting to have a good time'.

Activity. The drive towards activity and work, towards the full employment of one's energies and abilities in practical activities, such as the manipulative and physical activities, where the drives arising in connexion with social relationships (q.v.) are not greatly involved.

Self-reliance and *independence.* Two closely related aspects of the drive towards self-sufficiency, looking after oneself and not depending on other people, acting on one's own initiative, and, in some cases, showing independence of thought and ideas.

Superiority. The drive towards excelling others, either through one's own abilities and achievements, or through belonging to a superior social class or occupation.

Dominance. The drive towards exercising power and authority over others, either directly and personally, or through membership of a dominating group.

Display. The drive towards exhibiting oneself in some way in order to obtain social admiration.

Social conformity. The drive towards conforming in one's behaviour and ideas to those current in one's social group (either a small group of family, friends, etc., or a large group of society). This also included in some cases gregariousness—wanting to be with others and mix with them; and in some cases submissiveness and dependence, depending on others to guide and protect one rather than upon one's own initiative.

Humanitarianism. The drive towards helping and protecting others, and showing them sympathy and good-will.

Different individuals possessed drives differing not only in nature but also in strength, persistence and consistency. Thus the nature of the personality as it functioned in the individual's choice and conduct of her career varied according as it exhibited many or few strong or weak drives. The distribution of these drives in the individual, their relative strengths and their mutual relationship to each other, were of paramount importance in determining the nature of the personality. In stating this, it is not assumed that these drives as we have described them necessarily

constitute basic and unanalysable parts of the *structure* of the personality. They are the dynamic manifestations of the structure as it functions at the present moment, or as it functioned at some stated moment in the past. And though we are about to describe the more immediately apparent aspects of the personality structure, we do not pretend to be able to analyse its basic constitution, or the manner in which this was developed and determined. But a thorough and detailed study of these immediate aspects and functional tendencies seems a necessary antecedent to such a fundamental analysis.

Among the individuals studied here it was possible to distinguish: (1) *unitary* personalities, which were dominated by a single strong drive, or by two closely related ones; (2) *conflicting* personalities, in which one or more strong drives conflicted with one or more other strong drives; (3) *multiplex* personalities, in which several drives of varying strength existed side by side without awareness of conflict; (4) *integrated* personalities, in which conflicting drives had been reconciled and were now functioning in harmony with each other. In addition to these there were the individuals, to whom we have previously referred, who exhibited no strong drives functioning in connexion with their occupations, and who therefore possessed no very strong determination to succeed in these.

The ability to carry on an occupation successfully over a considerable period of time resulted to a great extent from the individual's total energy or driving force, a quality sometimes called '*strength of purpose*' or *determination*. It seemed probable that this quality was connected with the strength of the particular drives in the individual, but was not solely a function of these. It will appear from the cases described below that the 'strength of purpose' of the individual who possessed strong but conflicting drives was often uncertain and fluctuating. The 'strength of purpose' of the unitary personality was considerable, but, as we shall see, this purpose was sometimes rendered impotent by frustration which could be surmounted by the integrated personality.

The relationship of the drives in the various types of personality also appeared to be closely connected with the quality of introversion or extraversion. The awareness of the introverted individual was directed inwards, so that she observed to a greater or less extent her own drives and the manner in which they directed her towards certain activities and interests. If she possessed a conflicting personality with strong drives that directed her towards opposing and mutually inconsistent types of behaviour, she was aware of this internal conflict. But in certain cases, as we shall see, she was able by understanding the nature of this conflict,

and choosing activities which gave an outlet to the different drives, to resolve the conflict and become an integrated personality. The extraverted individual, however, was not immediately aware of her own drives, since her awareness was directed outwards upon the environment and its use to herself. Thus she tended to project any fluctuations in activity and any inconsistencies in behaviour upon the people round her, attributing the frustration of her drives to the resistance of others rather than to the impossibility of satisfying mutually inconsistent drives. These drives might then continue to exist side by side without there being any awareness of internal conflict, in what has been called the multiplex personality.

Another factor of importance to the individual's behaviour in carrying on her occupation was her reaction to frustration. The unitary personalities often possessed drives of sufficient strength to cope with obstacles and difficulties by overt activity, and these individuals did not meet with great frustration. The multiplex personalities could generally project their difficulties outwards, and therefore they did not experience frustration within themselves. The conflicting personalities, however, frequently could not act suitably, and whenever their drives were strong they in general experienced strong emotion, of one or other of two contrasted types: (1) anger, resentment and rebelliousness, or (2) fear, submissiveness, depression and feelings of inferiority. Those unitary personalities who had not been able to surmount the obstacles in their path showed similar emotions. But sometimes these emotional states were avoided either by aloofness—holding oneself apart from the field of conflict and its emotional repercussions; or by an actual escape from the situation which contained the obstacles. In the integrated personalities these emotions were much less prominent, since the individual had found a satisfactory way of life which did not conflict with her desires. In general, the more aggressive emotions appeared in the individual with strong drives, particularly drives such as superiority, dominance and independence which tended to make her assert herself against others. The more submissive emotional reactions appeared in those whose drives were weak, or were predominantly calculated to make her submit or conform to others.

But it must not be implied that the choice of an occupation and the ability to carry it on successfully were determined solely by the drives and their relationship in the personality. In the previous paper(2) we described the influence of other innate factors, and also of the individual's environment and upbringing. Important among the innate factors was

the individual's intelligence, in both its quantitative and qualitative aspects. Clearly the choice of certain professional occupations, and the chance of succeeding in them, were limited by the degree of intelligence possessed. They were determined also to a considerable extent by the quality of the intelligence, which was frequently displayed in the individual's other interests, as well as in her interest in her occupation. Different types of intelligence which may be instanced are: the abstract and logical, the creative and intuitive, the academic, the concrete and practical. The first will tend to create interests in philosophy, mathematics and some branches of science; the second in art and religion; the third in 'knowing' rather than in 'doing'. The fourth, more directly connected with everyday life, could be further differentiated into ability and interest in dealing with people directly, in manipulating things, and in physical activity and bodily exercise. We shall give further illustrations of these varying types of intelligence in describing actual cases.

Finally, it was clear that the choice of an occupation was influenced very greatly by the environment, particularly the social environment which operated during childhood, constituted by parents, teachers and companions. It is true of course that this influence was more obvious where certain drives such as conformity and superiority were dominant in the personality, than when other drives such as independence and altruism were dominant (see (2)). Since the majority of the individuals described in this paper belonged to the cultured and educated upper middle and professional classes, the environmental influence was relatively homogeneous throughout the group, and did not differ as much as it did among the children described in (2). Not the least important effect of this influence was seen in the 'identification' of the individual with her occupation, which we have already noted as being of frequent occurrence in the professional classes. Closely related to this was the encouragement which had been given in childhood to independence and self-reliance, to superiority and, to a lesser degree, to dominance; thus it was natural that these drives appeared frequently and clearly in the individual's choice of an occupation, and her attitude to it. Since most of the individuals were in comparatively comfortable circumstances, the security drive had not been strongly stimulated in them. Moreover, in this class of society the mention of the economic factor in connexion with the choice of a career is to some extent socially tabued; thus it is quite possible that the security drive played a greater part than the individual was aware of, or would acknowledge.

IV. Description of cases

It is not possible to give instances of all the variations in personality which were described in the previous section. However, certain characteristic cases of unitary, conflicting, integrated and multiplex personalities are presented below. As far as possible, the behaviour and ideas of these individuals with regard to their occupations is described in their own words; and certain additional information is given to illustrate the manner in which their personalities functioned in relation to their occupations.

(1) *Unitary personalities*

We have already noted that the independence and superiority drives appeared frequently among the cases described in this paper. They were especially characteristic of the unitary personalities. Though the latter were not altogether very numerous, there were a few strongly marked cases. Of these the most outstanding was that of 1, who possessed strong independence and superiority drives. She was a highly gifted individual, with an intelligence excellent in degree and broad in extent; it was partly abstract in quality, but also had an artistic and creative side, and a good academic understanding of human affairs. Thus she was able to excel in independent research work necessitating a generalized view of certain social activities:

She was of foreign birth and upbringing, and had had an unusually wide cultural training. She came to this country at the age of seventeen, in impoverished circumstances, and was faced with the immediate necessity of earning her living. But "we still had large ideas of living as we wished"; "I was very ambitious, not for a job or a career, but for knowledge". "I was in a new world where I was an outcast, though I only half realized it, and that I must make my own way in the world." She was entirely dependent on her own efforts; "I was too proud to say I was hungry". "Being quite unrepressed and quite confident, I tried for a teaching job; I didn't want governessing, because they seemed like a slave class." But at the school where she obtained a post "the people were ordinary, limited, narrow, uncultured"; "I didn't want to stay there indefinitely, but was ambitious to get something better". "I was blindly groping after a way of going to the University." "I was anarchic, and decided to make myself an expert where there were few people competing, and I would be able to get somewhere out of the ordinary ruck, and not be limited and tied down." "For eleven years I was doing odd jobs"; "I earned just to provide enough to live on while going on doing research". There was "no time and no money for intimacies, and hence no opportunity of getting married". She spent eight hours a day on teaching and eight on research work. Finally entirely through her own efforts she obtained a good University position where she can use "her own literary and creative side as well"; "I never thought I could be so lucky".

Thus 1 is an excellent example of an individual who was not only outstanding in ability, but possessed enough 'strength of purpose' to enable her to surmount great obstacles. And in this case her determination seemed to proceed from the two strong drives of independence and superiority, her other drives being too weak to offer any opposition, at least as regards her career.

2 showed strong independence and superiority drives. She possessed a good academic intelligence and had had a good education, but had been prevented by ill-health from following her chosen career of medicine. Although she did not appear at all suited by motivation or type of intelligence for a medical career, nevertheless she felt she had been frustrated and in consequence her determination seemed to be impaired in strength and to be frittered away in resentment and aggressiveness. She thus affords a good example of the inability of the unitary personality to cope with real frustration from external obstacles, and to replace a line of behaviour which it is unable to follow by some more feasible one:

She spends part of her time lecturing; "I like it immensely, I enjoy travelling and meeting people". But "there is no money in it". She also helps a friend who runs a private school in managing and organizing, "taking the responsibility if she's away". "I could organize anything in connexion with a school, but wouldn't like keeping accounts and dealing with bothering parents." "I dislike teaching—putting duds through the School Certificate." "I'm not born to it—I'm too rebellious against exams." She would like a job abroad "in some country where I could learn the language". "I was offered a lectureship in America, but turned it down because I disliked the American education system"; it's "superficial and cramming".

3 also possessed strong independence, with some degree of superiority. But these drives had not found a satisfactory outlet in her work, and she had therefore avoided painful feelings of frustration by an aloof attitude, an academic interest in human problems with little personal interest in people. This seemed to result also in a lack of determination and 'strength of purpose':

She had a certain degree of artistic intelligence and "I began by thinking vaguely I should like to write"; wrote a lot while at the University, and has done a certain amount since. But "I had to earn money, and realized that teaching seemed the only thing that paid". "I had always thought I should hate it, and did; got out of it as soon as I could." "I was more interested in my subject than in the people I was teaching; I had no interest in making them appreciate it when they didn't, though I liked sixth form teaching; I hated the supervision of girls, making them put on their goloshes, etc." "When thinking of other possible jobs was conscious of all the things I couldn't do, and therefore had to stick to the things I could." She took a librarian's course, and obtained a post as librarian; it was "badly paid, but great fun". Has enjoyed her present job a lot; "you are left to run it for yourself"; it is "a varied job",

but it is "very tie-ing; you have to be there rigidly during hours". But "I thought I was ready for a change", and has recently gone to another job.

4 had even less determination. Though possessing considerable superiority, she showed more conformity than independence and self-reliance, and an even greater tendency to avoid difficult situations than did 3. In fact, she seemed to shrink away from all possible obstacles, and might crumple up in the face of real frustration. This, however, she had not so far encountered, because she possessed every advantage of up-bringing and environment, and a good academic intelligence; thus her superiority had been satisfied at every step:

"I am doing the only kind of work I can do or ever wished to do." At school "things were made easy for you; it was considered the thing to do to go to the University". "I had always assumed I would; I felt it was the only thing I was fitted for; I knew I wanted to go on" with research work; "things were made easy by my tutor". The conditions at the University are "ideal for research work". "I can't think of anything else I would be any good at." "I shouldn't like school teaching, though I might have to do it if pushed to it; I hate the routine and lack of leisure." She previously had a post at another University; but "it was rather elementary work teaching there".

But unitary personalities were not invariably centred about the independence and superiority drives. There was another type of individual, who was not very numerous in this particular sample of women. Examples of this type were scientists, domestic scientists, gardeners, physical training teachers and dancers, whose main drive was the activity drive directed towards work giving opportunities for practical action either in the manipulation of things or in bodily movement. Drives operating in social relationships were less prominent in them.

5 had good intelligence of a practical kind. She showed considerable independence and self-reliance, but these were subordinated to a very strong activity drive functioning in practical scientific work. She had found it somewhat of a struggle to surmount the obstacles to the satisfaction of this drive, and hence showed a certain degree of rebelliousness and aggressiveness:

She went first to a domestic science college, urged by her head mistress who thought she had an "'applied mind'". But "I was thoroughly miserable over the work"; there was "too much of the domestic side, not enough science". "I was very keen on doing something really scientific"; but also "I was very keen on anything applied to practical problems". She obtained a science degree by working at evening classes; it was "very hard work", "a fearful grind". "I was planning for an industrial job; the plan became fixed because everyone told me it was hopeless." "I had some difficult obstacles to overcome; there is very little opening for women" in that type of job. Finally she got a post as an industrial chemist; it was "heart-breaking work in

awful conditions; it made me feel I wanted to get on in that type of work to a better job". This she obtained. Since then "I have all the time been able to expand the scope of the work"; "I dislike routine work, staying put and not expanding"; but in this job "new possibilities and problems are opening up every day; one is never at a loss for a line of development". "I'm not outstanding enough for original work" but "I enjoy applied work much more than pure biochemical work".

6, a woman of less intelligence and education, was employed in institutional management. She had a fairly strong activity drive, coupled with self-reliance; this directed her towards work which, though not directly manipulative, was active and practical, and involved dealing with things as much as with people. She had encountered fewer obstacles than had 5, and thus gave little evidence of frustration (since her career began); possibly also her drives were less strong:

"After the war...I started life again." But "I was always fond of housework and looking after the domestic side". She took a two-year course in house-keeping and "found it very interesting". "Before that I was lacking in self-confidence"; but "you learned you had to hold your own and not let people put upon you or help you too much—you have to look after yourself". Institutional management is "delightful work; one makes the post what one wants; one has got to work for it". "The work is never the same; you never know what's coming." "I would choose this type of work if ever I had to choose again."

7 was a teacher of physical training, an intelligent and active woman, who had had a successful career, with little if any experience of frustration. She provides a good example of the unitary personality thoroughly satisfied by her occupation and the outlet it afforded to her activity drive, and well adjusted towards life:

She had thought of going into the drawing office of her father's firm but "wanted something outside, not in an office". Thought of horticulture but in the end decided to take up physical training; "I was always keen on games and good at them". She enjoyed the training course although it was "hard work—you have to be strong, otherwise very exhausting". Liked teaching in a High School; "I liked the High School children—a wide range of children of all kinds". "Physical training is more active than other teaching; I never regret" having taken it up.

It is not very easy to demonstrate from these answers the attitude of this type of individual towards her work because she is seldom very explicit about it. But she gives the impression of being thoroughly and happily absorbed in the work itself, taking a real pleasure in the physical and manual activity it involves, or in the manipulation of the objective features of the environment. She seems relatively unconcerned with her superiority or conformity to others. She shows self-reliance and initiative, but there is little accent on any positive drive towards independence such as appeared in the previous cases.

There were also some cases of unitary personalities whose main drive was towards social conformity. Such cases are perhaps more frequent in society in general than they were in this group of women. Such individuals might find the prosecution of a professional career somewhat difficult, since these occupations normally demand a fair amount of initiative and of ability to stand alone without support from others. However, an example of a social conformer in a successful professional position was afforded by 8. Her behaviour seemed to be mainly guided by conformity to the opinion of a succession of individuals whom she regarded as wiser than herself, rather than by conformity to general social opinion; although the influence of the latter did seem to play some part. But the wise suggestions of the former, and her own good academic intelligence, had enabled her to obtain a good position, though it was clear that she was not capable of much original work. She did, however, possess sufficient self-reliance, in addition to her strong conformity, to fill positions of responsibility:

Her "head mistress suggested" what subject she should specialize in. She had thought of teaching while still at school; "I was sure I was going to teach while at college; most of my friends were going to do it; I didn't contemplate anything else." But the principal of her college "wanted me to be a University lecturer" and suggested a certain school of training to her; though when she went there she "found it hard to find anything to work on—there was less supervision there". Her tutor "suggested" her applying for a certain University appointment, which she obtained. "I was quite happy there, but got rather fed up with having no responsibility; I liked running things, and held as many offices as possible by the time I left." She was "told" by another tutor to apply for another University post—which she did although "I was loth to apply; I was afraid of having to go there for life". But when she obtained the post "I liked the responsibility—grew into it; I had never been in a responsible position before". Finally she was invited to take up another position; "I had always wanted it in theory; friends suggested it as the thing to do; I felt I should be much wounded if I weren't considered". "I was more suited perhaps" to the previous position; "I'm not sufficiently intellectual" for the present one; "I have ideas for research when there's no time to write, then they disappear when I get down to it". "I have often wondered if this has been the right way, but nothing else suggested itself."

But when circumstances were less favourable, the more dependent social conformers might find much difficulty in filling professional positions satisfactorily, since they were unable to live up to all they felt was required of them. Thus they felt frustrated, though in a manner different from that of the more aggressive unitary personalities described above. Their typical emotional reactions were those of fear, depression and feelings of inferiority. 9 affords a good example. She possessed good

academic intelligence. But she could not conform both to the attitudes inculcated by her parents, with their over-stressing of the importance of this intellectual outlook, and also to the more practical intellectual activities of teaching:

She was brought up as "a delicate only child living in the depths of the country"; didn't go to school but "was left to read alone and I wanted to go on with it; was left by my parents to follow up things for myself". She was taught by her father and specialized in the subject he taught her. "I always knew definitely I wanted to study; I loved reading and study, and University teaching was the only thing giving opportunities for that." "I loathed the idea of school teaching"; "I had two years of it and hated it"; "I was frightened of children" (not having been to school herself). But she liked teaching students; they were "not alarming like children". "I hated administrative work"; "I delight in research"; "true religion and sound learning have always been my main ideas". Finally she had to leave her University post "because of looking after my mother; I could no longer keep it and be a home daughter; I had great difficulty in doing so (leaving); they didn't want me to go", and she disliked it also.

(2) *Conflicting and integrated personalities*

It is convenient to consider the conflicting and integrated types of personality together, since the integrated personality generally showed a history of conflict earlier in life. The most frequently occurring conflicts were between the independence and superiority drives which caused the individual to set herself apart from or above the social group, and the social conformity drive which linked her more closely to the group, or the humanitarian drive which directed her towards a closer contact with other individuals. In some cases also there appeared to be a conflict between social conformity, submersion in the group, and humanitarianism, the individual approach towards other individuals.

10 presented an interesting example of an unresolved conflict between superiority and independence on the one hand, and social conformity on the other. She possessed outstanding intelligence mainly of the abstract type. But she had also had from childhood a generalized objective interest in human activities and customs. At the same time she was considerably influenced by a rather unusual upbringing, which had included a large amount of foreign travel. Thus the independence drive took the form of a desire to stand away from other people and observe them objectively; not to be submerged in and identified with any group. This desire was felt to a certain extent to be 'superior'; the attitude of independent observation was 'foreordained' since childhood. At the same time, there was a conflict with the desire for superiority which comes through identification with a superior social group. And rein-

forcing this latter was the drive to conform to such a group, felt in sensitiveness to the "effect of familiar people and surroundings", and in an almost oppressive confinement by the limitations imposed by these, which could only be escaped by foreign travel. But although her personality was conflicting, the independence drive, directed by her originality of mind, was dynamically very strong, so that she gave the impression of being an individual of real 'strength of purpose'.

She was determined to go to the University, which after some difficulty she was able to do, and embarked upon a distinguished University career. But "I get sick of academic and social intrigues" at the University; "people become so hypocritical about their work". She has always had a strong interest in travel; it is a habit and "I feel discomfort if I stay put too long". "I like somewhere unknown"; "the effect of familiar people and surroundings makes me behave in an introverted way, puts me on the defensive, but the effect of new languages and surroundings makes me behave in an extraverted uninhibited way, and take the initiative. I am completely adaptable in any surroundings. When adaptable like that to a wide variety of people, one comes to regard conventions as arbitrary, and can't hold fast to any convention. But to make a career, you have to feel your group is superior and has superior ideas, and be fixed to them; to feel some things are right and others wrong." "My interest is purely in individuals, not merely as representing and typical of a group. I am almost blind to differences between people from different groups—I have little subjective impression of group differences."

A conflict between independence and superiority on the one hand, and social conformity allied with security and pleasure on the other, was presented by 11, an individual of a type much more common than was 10. 11 possessed quite adequate practical intelligence but was not outstanding in any way; she had not the ability to fill any position that required really superior and independent intellectual abilities. Her drives were not in themselves strong; thus it was hardly surprising that she seemed to possess little determination and 'strength of purpose':

"I didn't choose anything in particular", "it was all thought out for me by my father"; "I was always familiar with the idea that I should go to college"; "all my school friends were going on to the University"; but "I wouldn't have been heartbroken if it hadn't come off". She thought she would take up a particular subject, though "I was not specially drawn to it", because "I had done best in it", and "I could do it with a friend who was also specializing in it". When she had finished at the University, "decided to research", "thinking I wouldn't teach whatever happened"; did that for two years, but there was "no money and no prospects in it"—"very few jobs and mostly routine ones". Then decided to teach and has "never regretted doing it"; "teaching isn't such a bad job as long as you don't think about going on till you're sixty". "I often wondered if there was any other sort of job to change to, but nothing else would pay as well"; "I occasionally thought of social work, but it doesn't pay"; also "you get nice holidays in teaching".

12, though less remarkable than 10, was a much abler woman with more 'strength of purpose' than 11. Her intelligence was of a good academic type, with some power of abstraction and some creative ability. Her upbringing was that of a normal upper middle class child, with the moral qualities perhaps rather overstressed by her parents; and she had not been to school. She exemplified a type of conflict between superiority and conformity which was rather frequent among the cases in this group:

> She was taught at home, and did not go to school, but after she had done rather well in public examinations, "the grown-ups decided I should go to college; it was the first I had heard of it". She was not successful at first in winning a scholarship and "I was very disappointed when I failed the third time"; but "I felt obstinate about it" and at length obtained one. She thought of changing her subject, but there was "a long tradition in the family of not liking to change a course once undertaken". "I really wanted to do research work, but it was financially impossible in those days, and I wanted to earn my living above all things—to be self-supporting". "I felt, 'I suppose I shall have to teach but I don't want to'"; there was "no alternative". "I liked telling people the things which I had found out for myself", but was not attracted by teaching the young. "I was more interested in the subject than in the people I was teaching", though "I have got more interested in them as time goes on". "I first had the romantic approach", "then took up the intellectual approach, later still the human approach". "The world of books was really a world of escape"; "I wanted to find something quite different from life in them". "At first I was rather proud of not being interested in other people; I thought the world of human beings an inferior one." She became a University teacher, but "the students didn't like my teaching". "I was told by a student that I was only interested in people's brains, not in themselves." "I was slow in my perceptions of people, and developed an inferiority complex about being stupid at understanding people; I became absolutely overwhelmed by the feeling of this." "I succeeded a very able teacher, and made bad mistakes because I tried to do things her way." But later "I accepted myself and decided to do things my own way, not other people's even if it was better, and therefore my inferiority complex disappeared to some extent; I was no longer self-conscious and miserable about it".

Here the superiority drive demanded an intellectual expression, and when her superiority was not accepted by the world in general, the first impulse was towards retreat into research work, escape into "the world of books". Conformity to family and social tradition, and also superiority again, decreed that she must be self-supporting. A further rejection of her intellectual superiority, this time in teaching, led to the emotional reaction constituted by "an inferiority complex". But an acceptance of frustrated superiority, and the decision to "do things my own way", i.e. not to conform to other people's ideas of what should be done, effected a

final reconciliation of the conflicting drives, and hence a satisfactory integration of the personality.

13 possessed fair intelligence of the practical type, and had had a reasonably cultured upbringing. Her strong superiority drive led her to desire a position of cultural and social superiority which she was unable to obtain. A painful conflict was aroused in childhood by her inability to conform to such a social background. This conflict was still unresolved and had resulted in strong feelings of inferiority. It was complicated also by a good deal of dominance; this was given some outlet in her present occupation, but was also frustrated to some extent because the people under her revolted against her authority. 13 presents a good example of an individual possessing strong drives but little 'strength of purpose', because of the conflict between them.

"My father's people were cultured people, but my mother's weren't like that"; this "pulled me both ways". "I was great friends with my father, but my mother was jealous of anything she couldn't understand", and had little sympathy for her; also her brothers looked down on her, and "I felt I wasn't wanted". When she was at school she was "prejudiced against teaching"; it was "the only thing expected, which set me against it". Also "my father thought it would make me more bossy". He sent her to a secretarial college, to "a place where I was among elementary school girls"; "it made me ashamed of my job"; "it was really just a place which pretended to train you in order to get cheap labour". But "I was conscientious; didn't like to give it up and so stuck to it". "I really wanted to take up nursing"; "I felt it would give me satisfaction"; "I have always revelled in looking after sick people"; but she was prevented by poor health. She obtained a good position in an office and "I liked this work very much", "it was so stimulating". But she got "strained" by it and was "afraid of a breakdown"; was also afraid it wasn't a permanent job; "men are prejudiced against women" in that sort of work. Was offered a managing job, but "I found it very distasteful"; "it was too much of a strain"; "I had to manage the whole thing", and the "work-people were very difficult". In her previous job was "a professional; I was treated with deference, as a person of importance". "Now I have no entry into society"; "I'm looked down on by my friends"; "I'm very isolated"; "I've held back from pushing among people".

A somewhat similar problem was presented by 14, who was characterized by similar inferiority feelings. But there was no dominance, and superiority was reinforced by security. The conflict was less painful, however; there was no history of conflict between divided parental loyalties, and the drives themselves were much less powerful:

She took up mathematics because it was "the one subject I could do at school"; "I never thought of it from the point of view of a job"; "I didn't realize it was not a good subject for getting jobs in". "I would have liked to do actuarial work"; "I ought to have gone into an office and worked my way up". But she got a scholarship at the

University; "the school was very keen to push people into the University". "Teaching never appealed to me." She had a statistical job for a time, and "liked the work best of all" that she has done. Then took a secretarial job, and likes it fairly well, but is getting bored after seven years of it; there is "nothing mathematical about it", "only routine administrative work"; it is "just a matter of getting used to it—no academic skill is attached to it". "I would like a job with more organization, with opportunity to meet more people", though she is not keen to take a job away from home.

In the case of 15 the drives which conflicted with conformity and security were activity, directed towards physical and manipulative tasks, and some degree of display. She was definitely less intelligent and less educated than any of the above individuals; but she affords an example of the individual who wants to employ her energies in skilled physical or manual work:

"I was very shy as a child and hated being laughed at"; "my sister could entertain visitors and I couldn't"; but "when alone I would dance to myself". "I wanted to take up dancing and teach it"; "I did teach it to younger children at school"; but "I wasn't allowed to" take it up, and had to go into a shop; "in those days dancing wasn't thought much of". When earning her living, joined a small ballet class but it was "too expensive to go on with—I couldn't afford the ballet frocks"; "my mother then recognized I should have taken it up as a child". "I still love dancing of any kind" and "teach it to men friends". Didn't like the actual shop-work much, but "my job gave me scope for other things"; "I was the favourite in the shop", and "liked arranging the flowers". She stayed with a friend who was a sister at a Nursing Home; "I went round doing all the things the nurses haven't time to do, rearranging flowers for the patients, etc.; I worked hard at it and thoroughly enjoyed it". She would have liked a job of this kind, but "there is no paid work like that to do". "I tried to get a job as a dentist's assistant" but there were "none wanted". Went into the millinery department of a shop, where "there is lots to do, even a little too much; I like this, I have lots of patience". It is "cheap millinery, for a poorer class of people"; "I am getting used to serving the country people; I like studying the people". But "I am used to bespoke millinery, and really prefer it".

In the case of 16, the conflict lay in the main between superiority and dominance on the one hand, and independence on the other; but it is possible that the former were reinforced by conformity, the latter by humanitarianism. The conflict was not really resolved, though it seemed to have outlived its original aggressive state, and become more depressed in emotional tone. 16 had had the type of upbringing normal in this social group, and also her intelligence was of the type most common in it; that is to say, it had an academic aspect, but was fundamentally concrete and practical. But it had also a rather unusual artistic and intuitive side; thus she possessed a longing for independent creation which was given some outlet in "the creative part that comes with teaching", but at the

same time was hampered by its rules and customs and its "bossing round".

When at school "I exerted some pugnacity in insisting on going to Oxford", because all the staff were Cambridge women; but "my father who died just then was an Oxford man" which strengthened her resolve. On leaving college, "I felt it didn't matter what one did"; "I was not conscious of a vocation; I had to earn my living and there were not many things open". "I started teaching straight away after college, but didn't hit it off with my head mistress; we didn't appreciate each other professionally." "I had a sense of failure which roused my pugnacity, not my inferiority." She obtained another post and "I was happy where I was". She was advised to apply for a headship though "I didn't really want it"; "being a head mistress seemed inhuman and aloof". But she obtained the first headship for which she applied, and remained in that post until she retired. From time to time "I thought of changing"; and finally retired because "I felt a good deal of my mind was not being exercised; I just didn't want to go on and get really tired, too tired to enjoy doing other things". "I have since wondered if it was really my job at all, though I didn't feel it when I was in it"; "I may actually have done it better than I now feel I did after giving it up"; it was "the bossing round—I hated it all the time, but it was part of the job and I accepted it"; "power even in a limited amount may be very disintegrating". "I was sometimes attracted to art, but there is no living in it, and I wasn't really good enough." "I enjoy writing; I have to do something like that to keep me cheerful." "But I do like dealing with people"; "it's the human problem which appeals to me"; "I do (since retiring) rather miss the creative part that comes with teaching"; "I'm not really devoted to children, but I do enjoy contacts with young minds".

17 was another woman in a position of authority; she possessed outstanding intelligence both on the abstract and academic sides, and also on the religious and intuitive. A clash between the rival interests set up by the two intellectual aspects was enhanced by drives towards independence and superiority on the one hand, leading to the remoteness from life of the abstract thinker, and on the other the practical humanitarianism of the social worker. The two drives and interests were, however, reconciled in educational work which included both the abstract theory and the ideals of education, and also practical humanitarianism on its executive side. The result was an integrated personality with more 'strength of purpose' than those previously described in this section:

"I had thought of teaching of some kind as long as I can remember", though adult rather than school teaching. But "a rival interest from fifteen upwards was the political and social; I thought I might turn to that after teaching". She did badly at the University in her chosen subject; "I was very disappointed over my class"; but her tutor suggested she should change to philosophy, and she "revelled in it"; "I discovered one could study all the answers to the things I really wanted to know". After some teaching and research work in philosophy she went to a training college and developed the teaching of elementary psychology and ethics under the name of

"principles of teaching". Thus "I joined up the teaching of adults with my social and political interest". "I was always sure once I had started it that it was the right line for me to teach"; at one time thought social work would enable her to do "something to meet more pressing needs" but training college work "is a really pressing need and the one I could do best". "I have had a fair amount of administrative work, and enjoy some parts of it." She gave up teaching after many years, but "I get satisfied by speaking (on philosophy and religion) and by coming in contact with the young"; "any young people whom you teach or who will make friends with you are interesting".

Another case of integration was presented by 18. She was less intelligent and cultured, and was entirely practical in outlook. She possessed both strong humanitarianism and strong dominance and independence. The former drive caused her to enter the nursing profession, where the two latter drives were thwarted and frustrated, setting up aggressive emotional reactions. But her 'strength of purpose' was such that she was in process of surmounting the obstacles to the satisfaction of the dominance and independence drives, as well as that of humanitarianism:

She meant to become a nurse when she left school at eighteen, but was then too young to begin her training, so took up secretarial work, and went into her father's office; also acted as commercial traveller for a time. But "I felt I couldn't help people with office work, or get any further in it", so she turned to nursing again. She also thought at one time of becoming a games mistress, but "nothing comes up to nursing". She hated part of her training; was "treated very badly"; "one is treated as less than the dust—one's individuality is stamped out"; "discipline depends on the ward-sister" and the work is very heavy. But she worked her way up to a more responsible position; "I prefer organizing work"; "I aim to get as high as possible" and "I hope to do reforms" in the nursing and Public Health services.

An unusual example of a personality, originally conflicting, in whom integration had finally been achieved on a humanitarian basis, was shown by 19. The basis of the conflict is particularly difficult to analyse in this case. 19 was a woman of normal upbringing and good practical intelligence with a strong humanitarian drive which showed itself in an overwhelming desire to be a doctor. Early in her career there was a conflict between this and between independence and security which made her desire to be earning an independent income. But a much more strongly conflicting factor was her hatred of pain and suffering. This may have originated in some painful personal experience (cf. her childish fear of the doctor), or in a latent fear of her own aggression. It now appeared in a horror of suffering in others which drove her both to avoid it and to relieve it. Finally the humanitarian drive overcame the avoidance:

"I had a longing to be a doctor" when still a child, although "I hated even seeing people sick". At one time she had been "afraid of doctors", but later "I was im-

pressed by a doctor who attended us when I was a child, and who suggested I should be a nurse; but I felt I couldn't because I hated illness". It was "necessary for me to earn my living"; "I knew I couldn't and wouldn't teach—I was too shy". So she took up dispensing—it "seemed the next best thing to medicine". It was "a good start, but I wanted the human touch". "I still had an intense yearning to be a doctor, in spite of hating the sight of blood" and although "it meant going through hell seeing people hurt"; though "it was more the apprehension than at the actual time". "I also wanted to be self-supporting", and so continued earning part of the year by dispensing while carrying on her medical training. She wanted to do either general or children's medicine; "an over-exaggerated sense of the value of life put me against surgery". "I like getting round nervous children and making friends with them." Wouldn't like a specialist's work or work in a clinic; "you don't know the people for so long as you do in private practice"; "they have soon gone out of your life". Even in work in a children's clinic "I wouldn't feel I was really looking after them"—only advising them.

Finally we may consider the case of 20, in whom the ruling drive seemed to be social conformity of the very submissive and dependent kind, which gave rise to a conflict resembling that of 9 with strong feelings of inferiority, because she was unable to conform to highly intellectual social groups. But some genuine humanitarianism helped her to get into intimate contact with children. Thus she was able to develop easier relationships first with them and later with the students who taught them. This gave her a stronger determination than she had previously possessed; but her drives were too weak for great 'strength of purpose':

She had decided when at school that she "wanted to stay at home and do domestic science for that purpose". But "an aunt said I ought to earn my own living" and "someone suggested my going to the University"; so she decided to go there because it was "near home". "I was quite ignorant of University life when I came up"; "I was too shy to get much out of University life". "I had no idea what to do" when going down; "I had never previously thought of teaching", but "put in for teaching jobs because my friends did so too" and "got a job at once". "I was a complete failure my first year; I was interested in my subject and in children, but knew nothing about teaching or managing children"; "it was an ordeal to be in front of a class"; and "I didn't get on with the staff". She later obtained a training college post, and finds "I can advise student teachers because of my own mistakes"; "I have gained confidence with experience". Doesn't feel nervous now in lessons because "I am so interested in the children". Also "I have quite a lot of contact with the students and get to know them"; "I like dealing with people".

(3) *Multiplex personalities*

The individuals who were said to possess multiplex personalities appeared to be motivated by drives which would have seemed to be incompatible with each other, and which in other individuals, such as those described in the last section, resulted in conflict. In particular,

strong superiority drives existed side by side with strong social conformity. Yet in the main these individuals seemed to be unaware of any such conflict. They did, it is true, report instances of disappointment and of unwelcome changes in their occupations. But in general the causes of these were exteriorized, they were attributed to faults and shortcomings in the social environment, and not to any inconsistency in the desires of the individual herself. Thus, if her dominating or superiority drives led to behaviour which was not successful or acceptable to certain persons in the social group, she tended to attribute the responsibility to these persons and not to herself. She felt that she was successfully conforming to the wishes, opinions and traditions of the social group, which other people failed to appreciate. Thus the whole conflict was successfully projected outwards, and was not experienced internally.

An excellent example of this process was given by 21. She was a woman of the type of intelligence usual in this group, possessed of strong superiority, dominance and social conformity drives. Her social background and upbringing were of the kind more common in the last century than at the present day, in that great emphasis was laid upon morals, duty, vocation, and so on. Some traces of this appeared in the case of 12, described above. But 21, with her tendency to exteriorize her drives, rationalized her desires for superiority, dominance and social conformity as a duty to have a teaching career which gave full scope to these drives. When frustrated by the superiority and dominance of others, she first reacted aggressively, but when this was not successful she either felt nervous or 'retired from the field' and went to another more satisfying position:

> Her headmistress was anxious for her to go to college for the honour of the school. Her father was also progressive in his ideas of giving his daughters a good education, and they felt bound to live up to it. He was rather opposed, on financial grounds, to her going to college, but she was determined to do so and have a career; he rather put her back up—previously she had been rather nervous about it. She had taken up a particular subject because it was her best subject at school; she found it moderately interesting at college, but regarded it mainly in the light of something she could teach and earn her living from. Regarded it as a duty to qualify oneself for a career; teaching was the only career open to University women in those days; there was no thought then of self-expression. She found no difficulty in interesting children; thinks she automatically teaches any child with whom she comes in contact; but finds older girls are much more critical and less spontaneous and easy to lead than younger ones. Is still very nervous of school inspectors or of anyone in a superior position listening to her teaching. Had a dispute with the Education Committee which resulted in her resigning her post and going to a training college, where she has worked happily for many years.

22 had much the same type of intelligence and upbringing. She was less dominating, at least when younger, and her social conformity was of a rather more submissive type. But she seemed to feel it her duty or "vocation" to carry on her work in a particular way; when frustrated and denied the responsibility for which she wished, she "walked out" and took another post:

"I was very shy and retiring as a child." She did the subject suggested by the school; "there was no purpose in me at eighteen". "I didn't set out to teach", but "had to do something"; "I feel I've drifted into everything". "If I had started on any other job, I would have done it; but I never felt there was anything else I might have done better." But nevertheless "I had a vocation for teaching"; "I could teach anything"; "I like taking up anything to teach to people"; "I like getting ideas into other people's heads". After teaching in one place for some time "I walked out of that" because "they wouldn't let me do the part of the work I wanted"; "I wanted to be responsible" for part of the school but "couldn't get it through". But she then obtained a training college post which gave her a satisfactory amount of responsibility and of opportunity of "getting her ideas into other people's heads". There she remained till she retired.

23 possessed more intelligence, both of the academic and practical type. She had little dominance, but fairly strong conformity and superiority. These were less completely rationalized as a sense of duty or vocation. The opposition between the two drives was not entirely exteriorized, but there was no evidence of strongly felt conflicts such as those described in the previous section:

When at college "I belonged to rather an earnest generation thinking in terms of vocation"; they "seriously considered occupations from that point of view, not merely as jobs". But there were "not many jobs to choose from" and therefore "I rather drifted into teaching"; there was "heaps of room for people in teaching" just then; "you could expect to be appreciated as a teacher" then. But "I really wanted to teach"; "wanted something with the human element"; "probably wouldn't have liked the Civil Service or office work". After doing some school teaching, she obtained a University post; "I wanted something less strenuous which gave one time to think and read more"; also "University work is a better paid job". But she found teaching "more interesting than pure research"; "I would have been quite happy school teaching". "I have thought I might teach abroad in a mission school"; "I have a slightly uncomfortable feeling I ought to have done it". But "I never had such an attractive job as I have here"; it is most "enjoyable"; "I like the human contacts".

Finally in 24 we find a striking example of all-round feelings of superiority together with considerable dominance and display, who at the same time felt completely assured of her social conformity, her acceptance and approval by the social group. Like 4 (see p. 303) she had good academic intelligence and every advantage of upbringing and social

background. Moreover, her 'superior attitude' may have been due n part to the fact that her parents belonged to a social group noted for its dominating behaviour. Unlike 4, she had no qualms about succeeding in any occupation she took up, and no fear that her conviction of superiority was resented by others, although she might feel contemptuous of them:

She always wanted to work on her particular subject; "it amused me ever since I was a child". She was sent to the University by her parents and greatly enjoyed it while there. Her tutor suggested she should do research work. "I had no ideas about a career"; "I thought vaguely of teaching"; liked teaching—had organized school work for young children. Also likes University teaching and lecturing "because it is like acting"; "I am amused by University and college politics". "I want a permanent teaching fellowship"; "I want a career you can get on in, a ladder to get up"; that is "the advantage of a University job", it gives you opportunities for that. Has also done some social work, been manager of a church school, run a play-centre; it is "an amusing part-time job, keeps one's feet on the earth", but she wouldn't like it permanently. Has also trained to teach dancing, for fun, but wouldn't do it for a career for anything; it would be "infuriating"; doesn't like the people in it—they are "stupid people and so affected". "My (present) job ends next year" but "I would love to stay on" at it.

(4) *Cases showing little strength of drive*

It is interesting to contrast with the cases previously described those individuals who displayed little 'identification' with their work, and little strength of drive in carrying it out. The following table gives the number and percentage of women in the total sample with different types of education and occupation who seemed to exhibit 'identification':

	Total number	Number showing 'identification'	Percentage showing 'identification'
With University education	45	35	78
Without University education	26	9	35
With professional occupations	44	38	86
With non-professional occupations	27	6	22

Too great a weight should not be placed on these figures, since it was not always possible to determine with accuracy the exact nature of the individual's attitude to her work. They seem to show, however, that it is the professional occupation even more than the form of education which is related to 'identification'. It would probably be difficult for a woman to carry on a profession successfully over a considerable period of years unless she were to some extent 'identified' with it and took a personal pride in it. Thus those women who took little interest in the work for itself tended to gravitate into non-professional occupations (27, described

below, is a particularly instructive example of this). Conversely, those women who were compelled by lack of education and unfavourable social and economic circumstances to enter non-professional occupations such as secretarial and commercial work may find that much of the work lacks interest in itself. Unless they possess a strong activity drive, like 15 (p. 310), and are able to find interest either in some physical activity, or in the manipulation of things or of objective conditions, it may be difficult for them to regard their work as anything more than a bare means of livelihood. Now, on the one hand, many of the occupations open to women, the clerical occupations, for instance, give little scope for the functioning of the activity drive. And on the other hand it is probable that many women possess this drive only to a small degree; they are far more interested in personal and social relationships than in 'things'. Thus it is not surprising that women in the non-professional occupations find little stimulus to 'identification' with their work.

The attitudes towards their work of those who lacked 'identification' were various. There was, firstly, the attitude that work was just labour—something one had to do to keep alive, but would relinquish if ever one had the chance. Secondly, there was the attitude that work was a socially approved activity, and that in order to conform to the opinions of society one must display a certain interest and industriousness in one's work. Thirdly, there was the attitude that work was quite pleasant as long as it was not too arduous or monotonous, and, frequently, if it provided plenty of opportunity for social intercourse. None of these attitudes seemed to be conducive to any real interest in the work for itself, or to any personal pride in performing it well. In fact, any kind of work was regarded as a means to an end, not as an end in itself.

25 regarded her work mainly as a means of livelihood, but her choice had been guided by rather submissive social conformity and by pleasure:

> She wanted to go into a bank, but her mother couldn't afford to keep her on at school to qualify for it, so she went into a shop; "mother liked the idea of this job", it was "pleasant work with pretty things" and "not very hard work". But she regrets the "better money" she would have earned in the bank; there's "not much money in artistic jobs". She used to think she would like to be a kennel maid, but "you have to work three years for nothing". Her firm wanted her to go to a job in a London branch, but "I had friends here, so I stayed on"; "I don't really want to go now". Thinks 'I shall stay on unless something very alluring turned up"; but "I might leave to get married".

26 also seemed to be motivated mainly by economic security, but she showed a certain desire for interest and variety as well; and she was

strongly dependent and socially conforming, and hence afraid of responsibility or of having to show any individual initiative:

She took up shorthand and typing "because all the other careers seemed too expensive". She first went to work in an office where the work was interesting but "I was only a junior, the work was too advanced for me"; "I had too many responsibilities"; "I had all different kinds of jobs to do". Then went into the Civil Service; "a friend suggested it". It is "secure, and people are fairly treated", and there is "good pay". The work is "rather monotonous", "rather mechanical"; "I would sometimes like more brain work"; there is "not a great deal of responsibility". "I have sometimes thought I ought to leave, but nothing else would be so lasting." "I wouldn't like to work in London."

27, however, had well-to-do professional class parents, and had had a University education. She seemed to have taken a job because it was the thing to do, and because it provided a means of passing the time:

"I didn't want to teach—disliked the school-marm idea intensely"; there was "not much else to do". Someone "suggested a secretarial training" and it "seemed useful", so she took one. She learned to type, but her "shorthand is very poor"; "I never worked hard at it, never could get good at it". "I wanted not to live away from home, in digs", and first of all "got a social job" near her home. But "I didn't like it very much"; "it was just organizing and committee work"; there was "a difficult woman running it" and "I felt just a minion". So she then took a job in a typing office. "I found the work tiring at first", but the "regular routine is healthy, though". "I haven't looked for anything else"; this job "suits me beautifully"; "I know I am indolent, but I am comfortable here". "I haven't thought if I shall get bored with it"; "I live for the present".

Finally 28 gives an example of a type which is less common now than formerly, of an intelligent and educated individual who is motivated almost entirely by conformity to a well-to-do social background that disapproves of women in paid professional occupations. She had some desire to strike out for herself, but insufficient independence and superiority to drive her into doing so in the face of family opposition and social tradition:

She had been brought up abroad, but was anxious to go to a boarding school because "I felt angular and isolated"; "I wanted to find my feet and get my level"; "I had been so much with grown-ups". One of her teachers and another friend "encouraged" her to go to the University, and her mother "thought it a pity she should go straight back (abroad) at eighteen". But she didn't work very hard at the University; "I had been strictly brought up and kept to heel by my mother"; therefore "so much liberty and so many things to do went to my head". After two years at the University her parents wished her to return to them, which she did, although she "loathed leaving it". "Social life (abroad) was not my line", and it "took me a long while to settle to it". Later she returned to the University for a time, and after graduating "had thought of trying for a job". But it "wasn't necessary or con-

venient" for her to do one. "I had to look after my mother" and later travel with her father. "I might have liked to do some kind of social work". As it is, she has spent her life doing odd jobs.

V. QUALITIES OF THE PERSONALITY LEADING TO OCCUPATIONAL SUCCESS

(1) *Intelligence*

We may sum up these studies of the variable qualities in the personality as it functions in the career or occupation, by considering the nature of the qualities related to success and failure in the occupation. It is of course well recognized that the career which is chosen must be fitting to the intelligence and innate abilities of the individual concerned, and also to her acquired habits and attainments. It is obvious that certain occupations demand a high degree of intelligence from those who enter them. Moreover, they may require a particular quality of intelligence. For instance, the most common women's occupations,[1] school teaching, nursing, secretarial work, commercial work and personal service, require varying *degrees* of intelligence, but it must be mainly practical in quality, rather than abstract or academic; though a certain degree of the intuitive type of intelligence may also be an advantage. But the University teachers and research workers who were relatively frequent in this sample of women required academic and abstract intelligence; and there was evidence that those who lacked the latter were relatively unsuccessful in carrying on original research work.

It is also frequently stated that those whose occupation makes insufficient demands on their intelligence will be unsuccessful and discontented. This seemed to be true of those cases who 'identified' themselves with their occupations, and who possessed appreciably strong superiority drives; examples of this were afforded by 14, 2—and 1 at the beginning of her career. There is no evidence to show that this occurred in the absence of these two factors; see, for example, the cases of 27 and 28.

(2) *Acquired habits and attainments*

Of almost equally great importance are the individual's acquired habits and attainments, including not only what has been learned at the school and University (although the great importance of this was seen with 4 and 8), but also that which depends upon the general cultural

[1] Out of a total of rather over 5½ millions of women registered in the 1931 Census as in employment (this excludes those employed in their own homes), 34% were in personal service, 11% in commercial occupations, 10% clerks and shorthand typists. Of a total of 388,806 in professional occupations, 51% were teachers and 40% nurses.

background of the home and the parents' social class. This background again includes the cultural factors, which were well demonstrated in the cases of 1, 9 and 13; and the physical factors in the home environment (see, for instance 10's travel habit); and also the general ideas inculcated by the parents. Thus in the case of 12 and 21, and also of 9, we saw the effect of ideas about vocation, duty, obligation, arising from the home background. The conviction shown by 24 of her superiority was due in part to the outlook and traditions of the particular social group to which her parents belonged. 28 owed her inability to settle down to a definite occupation very largely to her parents' attitude to women's work. An even clearer example of the play of rival social influences is shown by 29:

"I was brought up by maiden aunts, two of whom were intellectual and were anxious for me to go to the University." Her head mistress was also "anxious for me to go on". But "I was the first girl in the family to go to the University; my father and sisters didn't wish it" and "it was difficult to work in the vacations in consequence". "My family didn't want me to go away from home" after finishing at the University, and "I didn't have to earn my living". But "my tutor suggested going away from home" would be a good thing. She was unable for some time to settle down to a permanent job, though she did a lot of travelling abroad which she much enjoyed. Then her cousin, a University professor, suggested a particular line of research work and also "suggested my lecturing on my work". Thus finally she emerged from the family struggle and became a full-time University lecturer and research worker.

No doubt instances of this type of influence could be multiplied if fuller information had been obtained about the atmosphere of the home background; but people were often reluctant to acknowledge the very strong effect of this atmosphere upon their activities later in life. Our information, however, was sufficient to show that these environmental factors, produced by school as well as by home, could exert a directing influence, of which the individual was frequently only partly aware, upon her choice of an occupation and her subsequent conduct of that occupation. Of course it must not be supposed that the individual's choice of a career necessarily conformed to the ideas of parents, school or social group, with regard to suitable careers. This occurred most readily in those who possessed a strong social conformity drive. The individual with a strong superiority drive might endeavour to rise superior to them, while the independent individual might choose something quite different. Thus 10's academic career was independent in every way of the ideas current in her home background. At the same time, some influence of these environmental factors could usually be detected. Thus it is only the individual of very exceptional ability, independence and initiative who is

likely to succeed in a career which is completely at variance with all the traditions and influences of her past life. 18 may have been such an individual, but we have no evidence of any others among this sample of women.

We see then that the social environmental factors may have a strong directing tendency which operates upon the individual's behaviour in virtue mainly of her tendency to social conformity. This latter drive may either reinforce the other main drives, may conflict with them or may be overcome by them. Reinforcement frequently occurs in the case of individuals with strong humanitarian drives. The occupations which give most scope for the functioning of humanitarianism are now in general socially approved. This at least is true of teaching and nursing, though perhaps less true of medicine and some kinds of social work. For instance, 19's "father never expected women to do many things, and thought in terms of teaching" and not of medicine. But on the whole the demand in all social classes for women with humanitarian tendencies is greater than the supply, and such individuals find little difficulty in choosing and maintaining a career.

The relationship of the attitude of the social group to the other drives is less unequivocal. We have already maintained that independence and superiority are frequently regarded favourably in the professional classes. This is not always the case, or in all classes. An example was afforded by 29. It is true that she also possessed a strong activity drive directed towards manipulative work, but this did not enter into the conflict, which resulted mainly from the desire to do independent work:

> She was brought up in a small country village, and even when a schoolgirl "I wanted to get away from home". But her father, who was a farmer, "believed a woman's place is in the home; he thought a woman should be able to run a house"; "he thought teaching was the only profession for women and he hated teachers, therefore he didn't want me to go to college". "I had to leave school and come home for a year; I loathed housework and wanted to get away." Eventually she managed to get to college and take up science; "I thought vaguely I should like research". She obtained a succession of scholarships and grants although "dislike of women is general" in her particular branch, and the authorities "were against me getting" a permanent post. However, in the end she surmounted these obstacles and did obtain a permanent research post.

Thus the individual might in some cases expect encouragement and in others opposition when guided by independence or superiority in choosing and carrying on their occupations. The social attitude to dominance was also variable; we saw that 13 and 18 both met with considerable opposition. But 16's use of dominance in her position of authority was on the

whole approved. Thus it seemed probable that dominance, as also superiority and independence, might lead to occupations the choice and maintenance of which would conform to the approval of the social group, when these drives existed in individuals of superior intelligence and ability, coming from a superior and successful class of society. At the same time, of course, superiority and dominance exercised in carrying on an occupation are always liable to meet with opposition and resentment from those members of the social group who are being excelled or dominated over. And individuals of lower intelligence and social status are expected to enter humbler occupations in which independence, superiority and dominance can find little outlet. The same may also be true of display (contrast, for instance, the social attitude to 24 and 15); but on this point the data give insufficient evidence. Also the different types of occupation towards which an individual is directed by superiority, independence, dominance and display are given varying degrees of social approval. For instance, occupations in which women compete with men are frequently less favoured than those peculiar to women (see for instance the social disapproval of 29's work). The same is also probably true of the activity drive. It is favourably regarded when it leads to domestic science or physical training. Thus 6 and 7 had experienced few if any obstacles. Social tradition had also urged 5 to take up domestic science, but was against her choice of industrial chemistry, as being a man's job. 15, again, had no difficulty when her activity operated in the occupation considered suitable for her social class—namely, that of dressmaker or shop assistant. She was also able to do dancing as long as she kept this simply as a hobby, but she was not allowed to take it up professionally.

The strong social conformer, as a rule, found few difficulties in her path provided that her abilities were fitting to the socially approved occupation she tried to enter, and unless she was too dependent in her conformity, like 20. But again it is quite probable that anyone like 20, if she came from a lower social class, would find it easier to choose and maintain an occupation requiring less initiative than do the professions.

Economic security, as we pointed out above, is not viewed very favourably in the upper social classes as a direct motive for adopting a profession, though there is little doubt that the underlying drive exists. That and pleasure are, for instance, drives which operate frequently in causing an individual to enter the teaching profession; but few people acknowledged this with the frankness of 11. Again, both these drives would be freely admitted in the non-professional classes, as they were by

25 and 26. Indeed, it seems probable that the nearer an individual approaches the poverty line in the social scale, the more powerful and dominant would be the security drive. And since in the non-professional classes less stress seems to be laid upon 'identification' with the occupation, and upon serious efforts to work hard and succeed in it, the functioning of the pleasure drive in the choice and conduct of the work meets with less disapproval than in the professional classes. For the influence of the social environment as operating through social conformity not only reacts directly upon the other drives, but also indirectly, with regard to the tendency of the individual to 'identify' herself with her work, and to find in it an outlet for her main drives. We discussed the relationship of 'identification' with the social background in section IV (4). Here it suffices to say that the school and University environments usually do all they can to enhance the importance of 'identification'.

(3) *The relationship of the drives in the structure of the personality*

We have already mentioned that the 'strength of purpose' or determination of an individual to carry on her occupation successfully, and her reactions to frustration, were related not only to the strength of the individual drives, but also to their mutual relationship in the personality. The unitary personality when dominated by one or more powerful drives such as independence, superiority, dominance, or activity, possessed considerable 'strength of purpose', and was able to overcome obstacles to a remarkable degree; 1 showed this clearly. If an individual with a unitary personality had less powerful drives, she showed less 'strength of purpose', and she might experience considerable frustration, particularly if she had less intelligence in circumventing obstacles than had 1. 2 and 5 gave evidence of this frustration, which aroused resentment and rebelliousness, since they were emotionally aggressive rather than submissive. But 5, with more 'strength of purpose' than 2, and perhaps fewer obstacles, had been able finally to overcome these and obtain a successful career. 2 had not done so, and was still rebellious and resentful. Less strongly motivated and less aggressive individuals such as 3 and 4 tried to obviate frustration by avoiding the course of activity in which obstacles might be expected. Finally, the thoroughly submissive individual, with weak drives, such as 9, either avoided difficult situations or capitulated to opposition. It is probably in the reaction to frustration that the unitary personality is likely to be less successful in carrying on a career. Such a personality possesses somewhat of a 'one-track' mind, and

is comparatively unadaptable, because her one or two drives tend to lead her in one direction only. If this is completely blocked, as in the case of 2, she may remain unadapted, and consequently resentful and maladjusted for the rest of her life. Or she may adopt the almost equally unsuccessful course of avoidance, entering an occupation in which she encounters little opposition, but from which she obtains little satisfaction.

The conflicting personality with strong drives may seem to have even less chance of succeeding in her occupation than has the unitary personality, since one set of drives will direct her towards one type of activity, and another towards another. Even when one activity is finally selected and adhered to, a feeling of frustration remains, either resentful in tone (as in the case of 13 and 16) or depressed (as with 11 and 14); and with vacillation and weakness of purpose as a probable consequence. Only the unusually fortunate individual was able like 10 to pursue alternately the occupations which gave scope to her conflicting drives; and even in her there was a tendency to escape the most difficult part of the conflict. But it was clear that the integrated personalities had been able to adapt themselves by resolving the conflict between drives. The methods of solution offer problems of great complexity and difficulty; we cannot advance more than one or two possible suggestions as to how they took place. In the first place, the gifted individual could sometimes find an occupation which gave scope to the conflicting drives. Thus 17 possessed the necessary intelligence and culture to obtain a position in which superiority and humanitarianism could both operate. 18 achieved a position giving an outlet for both dominance and humanitarianism mainly by sheer industry and strength of drive. 19 was able to concentrate on those branches of her profession in which the ability to relieve pain could be emphasized in contradistinction to the necessity to inflict it. 20 found an occupation in which humanitarianism could overcome her excessive dependence. But even when the occupation continued to afford obstacles to the satisfaction of certain drives, the individual could sometimes adapt herself to this situation through obtaining insight into the nature of the conflict. The clearest example of this is given by 12: "I accepted myself" (and her "slowness in perceptions of people") "and decided to do things in my own way, not other people's, even if it was better, and therefore my inferiority complex disappeared; I was no longer self-conscious and miserable about it". But again only someone with considerable intelligence and a natural gift of insight would be able to achieve such a solution. These cases do, however, illustrate the fact that the 'strength of purpose' and the ability to overcome frustration

may be greater in the integrated personality than in the unitary. The wider range of their drives seems to enable them to adapt themselves to a broader field of activities, so that if they cannot successfully carry on one type of occupation or one branch of their profession, they can substitute another.

Finally we must discuss the 'strength of purpose' and the ability to succeed of the multiplex personality. To judge from the cases described in section IV (3), the ability to succeed seems considerable, because the multiplex personality does not feel herself to have failed or to have been frustrated. If obstacles appear, they are usually surmounted or circumvented almost automatically by means of the considerable strength of the particular drive which is being opposed. But the painful feelings of frustration, inferiority and resentfulness which occur in 'inwardly directed' unitary and conflicting personalities are not felt, and thus the individual is aware only of the apparent success of her activities. Nor is she aware as a rule of any incongruity between behaviour produced by one drive and behaviour resulting from some other opposing drive, so that she is able to combine two types of activity or change rapidly from one to another without consciousness of inconsistency. If she does become aware of inconsistency or opposition, she attributes these to the behaviour of those with whom she comes in contact, or even to the exigencies of fate, but disregards the opposition between her drives. Thus she usually manages to carry on her occupation to her own entire satisfaction, though not always to the satisfaction of those around her. Indeed, the exercise of power by such an individual may be dangerous, since she may be quite unaware of the strength and ruthlessness of her dominating tendencies. She often shows great determination; but it is doubtful if this could be called 'strength of purpose', since the latter implies awareness of a single end, or of mutually consistent ends, which is steadily pursued. It was fairly clear that the multiplex personalities thought that they were aiming at some humanitarian end, or at the pursuit of knowledge, and never felt that their real purpose was the satisfaction of their underlying drives.

We must conclude, therefore, that the unitary personality with strong drives will be able to carry on a career consistently, perseveringly and successfully, provided she does not encounter obstacles which cannot be overcome by direct attack. Among such people we must probably include the 'single track' enthusiasts who are the pioneers, the leaders and the reformers of every age. But the best administrators, teachers and humanitarians are those with integrated personalities, who understand

doubt and conflict, can adapt themselves to frustration, and successfully undertake a wide range of differing activities.

In conclusion, my acknowledgements are due to the Medical Research Council for the personal grant which made it possible for me to carry out this work, and my thanks to Professor Bartlett for his advice; I also wish to thank all those who answered my questions about their lives and careers.

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STEREOGNOSIS AND TACTILE 'AUTO-SENSATIONS'[1]

By ALICE BOEHM

I. *Introduction* (p. 327).
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I. Introduction

The work of which a short report is given here is concerned with the analysis of the impairment of tactual recognition of objects touched with the left hand in a case with a lesion of the brain, who, from a psychiatrical point of view, had remained absolutely normal. The attempt to explain the case led to a hypothesis which seems to be of some significance for our general conception of the world of touch and of its construction.

The case[2] was that of a highly intelligent woman (LL.D. and student of philosophy) with a psychological training who, about ten years before the beginning of this inquiry, had undergone an operation for the removal of two tumours of the brain situated in the region of the right parietal lobe. Apart from an amaurosis of the right eye, the damage resulting from the lesion was strictly confined to the left side of her body. Tests of her *sensibility* showed a disturbance of all the cutaneous senses and a particularly serious impairment of *kinaesthesis*. There was no impairment of *vision*. Neither cognition nor recognition of objects by touch was possible in the left hand. The right hand showed no anomalies whatever.

II. Description of the case

Since the failure of her *stereognostic* ability was the most striking characteristic of her tactile agnosia and was, therefore, the main object of this analysis, a few examples may be given to show the kinds of mistakes made by the subject.

A pencil was held by the subject with the thumb and index finger

[1] An extract from a psychological analysis of a case of tactile agnosia. The complete analysis was the subject of a research study in the late Prof. J. Lindworsky's department at the German University of Prague.

[2] The author's deep thanks are rendered to this subject whose long-continued interest and acute observation made this analysis possible.

pressed respectively against the point and the flat end (the experiment was, of course, conducted with closed eyes); she reported, "Here is a plane and here a point; but it is only through my reason that I know they are connected". If she laid her left hand with the fingers spread on the table, the impression she received was not that of a continuous plane but only of isolated strips or patches. Thus she was not aware of any parts of an object that were not in direct contact with her skin. Moreover, the impressions were experienced in a certain isolation. On another occasion, when the subject was feeling an ashtray, she imagined that she had to do with a little silver dish which had been tried previously, but searched in vain for the characteristic markings; and she said, "Perhaps the reason why I can't find the details again is that I don't know which direction to try, as everything is isolated". It is understandable, therefore, that she did not notice when she was given two objects to hold instead of one.

This isolation of impressions, however, appeared not only when experiencing simultaneous but also when experiencing successive impressions, so that the contents, as the subject herself once expressed it, did not coalesce but rather took on a kind of "kaleidoscopic" character. This came out very clearly in the subject's attempts to copy in plasticene the objects she had felt with her fingers; she found it much easier when she was allowed to mould several models each corresponding to one 'aspect' of the object concerned.

The changes, however, were not confined to the apprehension of the object as a *whole*, they also affected the impressions given by the various *elements* of plastic form. Planes, edges and corners were confused apparently in a completely haphazard way; every possible mistake occurred, so that planes might be confused with edges, edges with corners, and corners with planes. Thus the subject would sometimes start from an edge and imagine she was feeling along it while in reality she struck out at right angles to it across the plane surface. This came out especially clearly in an experiment in which the outlines of the tops of pastry cutters, such as are used in the kitchen, were to be traced with the fingers, since here the actual process of touching could be closely watched by the experimenter. It was observed how her finger tips would slip off the edge and reach the table, and how she would go on groping about there and would not notice until much later (often only on account of the difference in the material) that she had missed the object altogether.

Again, while she was feeling an object, one impression might suddenly change to another; what had seemed large would become small, what had been round would all in a moment acquire corners, and that quite often

while one and the same detail was being examined. Thus, the subject once reported when feeling a pencil with a case, "Cold, edged. Not always—sometimes it is round. How small it is. Now it is different, it seems to be longer".

Again, the assertion was often made that she got an impression of cotton wool or felt surrounding the objects. But in the case of the sound right hand not even an approximately similar impression could be produced, whether by wrapping the article in felt or by covering the hand with a glove or by any other device.

Summing up, we may say that the most striking characteristics of the subject's astereognosia were, on the one hand, a *failure to synthesize* either simultaneous or successive impressions into a unified conception of the object, and, on the other, a *failure to distinguish contours* owing to an apparently arbitrary confusion of corners, edges and planes.

III. Discussion of the phenomena

Difficulties in the explanation of these phenomena arise particularly with regard to the first point. For the want of integration seems, at first sight, to resist any interpretation by reference to a reduction of sensibility, because of its apparent independence of stimulus and response. But, on the other hand, the mere fact that the anomaly was confined exclusively to one side militates against the attempt to explain it either by some disturbance in reproduction or by damage to some higher psychic function; and this quite apart from the theoretical difficulties involved in the latter assumption in view of certain conceptions of cerebral localization still, of course, controversial, which will be touched upon later (see (1)).

The hypothesis on which the interpretation of the phenomena is built up depends on a series of observations from which the following may be selected. In one of the localization experiments in which the subject was touched on the lower phalange of the little finger of the left hand (with a single pointer) she reported, "Two points—on the lower phalange of the little finger and the middle phalange of the fore finger, *but they were quite close to each other*". (The fact—not indeed insignificant in itself—that instead of a single touch two were perceived, need not be taken into consideration here.) What is essential in this context is the circumstance that the two touch impressions, though localized in two different phalanges separated from each other by two intervening fingers, yet were experienced as close together. Now, this experience, contradictory in itself, is strikingly similar to certain optical phenomena appertaining to the

vicinity of the blind-spot. Those points that are still just seen with the parts of the retina adjoining the blind-spot and on opposite sides of it appear, on the one hand, not to be separated—because nothing (including, of course, black) is seen between them—yet are not, on the other hand, perceived close together—on account of the difference of their positions in the visual space (2). In the case of our subject, therefore, we may assume that in that part of her hand which extended between the fingers which she believed to have been touched, there occurred at the time a failure to produce sensations which is analogous to the failure which occurs physiologically in the blind-spot. But this is to say that, in the normal subject, the intermediate part which is subjected to no external stimulation—and with it, of course, the entire surface of the body—must obviously give rise to some sort of sensation; otherwise the same kind of impressions, contradictory in themselves, would unfailingly constitute normal experience as well. As a matter of fact, we are always more or less explicitly aware of our own bodies in a way which is not merely representation but very definitely perception—even though our eyes be shut. But how could that kind of awareness be effected unless by sensations from the body continually reaching our consciousness? This will perhaps become even clearer when we compare the subject's impressions of her own body with normal experience. In one of the localization experiments (with the eyes open) in which the subject was touched on the ball of the left middle finger, she first aimed, with open eyes, at the forefinger, groped a little in the air, and then corrected herself to the middle finger. She reported, "There was a discrepancy between the optical and tactile impressions The *index finger was one too many*; I am not conscious of it without looking. I don't know why I made for it with my eyes open".

Two observations, not taken from systematic laboratory experiment but from the everyday life of the subject, are furthermore to be cited here as being particularly illustrative of her experience. She reported that once when she saw a rubber glove lying in the bathroom she had to consider for a moment whether or not the object was her own left hand. This experience will perhaps become fully comprehensible only when we compare it with the second, also taken from everyday life. When turning round in her bed and unintentionally changing the position of her left arm she used to wonder, when the latter happened to touch her thigh, what object had been dropped on her. Thus she experienced her own limbs just as though they were any other object of the external world that she perceived by sight or by touch; consequently, she would occasionally not be able to tell unhesitatingly whether external objects incidentally re-

sembling the human form constituted part of her own body or not. This fact obviously implies a lack of sense data in her experience.

Hence, we arrive at the following hypothesis. Normally, a kind of parallel to the visual grey in the retina is to be found in the tactual field. The sensitive endings of the cutaneous nerves, spreading all over the surface of the body, are, like the retina, in a state of continual excitation brought about by internal stimuli such as, for instance, the circulation of the blood. This produces sensations analogous to the visual grey which may conveniently be called *tactile auto-sensations*. The awareness of one's own body is, to a large extent, based on these auto-sensations.

As for the cognition (and recognition) of objects by touch, we may proceed to the following view which also gives a clue to the interpretation of the subject's most puzzling blunders in stereognosis. The non-optical content experienced in touching an object consists, according to this view, partly of sensations set up both by inner and outer stimuli, and partly of sensations resulting *exclusively* from internal stimulation: the former occur in the places of contact while the latter arise or, rather, persist in the portions of the skin which are not in touch with the object. Now, a pathological rise of the threshold would naturally, in the first place, nullify the sensations dependent on those excitations that are not reinforced by external pressure; the parts of the limb outside the places of contact would therefore remain, as it were, "mute". The mere touch impressions in themselves, however, fail to bring about a perceptual impression of space continuity in the external world because the sense data normally inducing its reproduction—i.e. the sensory continuity arising from the touched limb—are lacking: *the perceptual image of those parts of the object that are not in direct contact with the organ of touch obviously implies a certain integrity of the tactile field as, in an analogous case, the bridging over of the blind-spot in visual perception requires a certain integrity of the optic field.*

Now, as a reduction of response to mere internal stimulation in consequence of the high threshold was to be assumed in our subject, it is easy enough to explain why the details of the objects felt remained for her unconnected instead of being synthesized into a whole. This also explains the fact that when she laid her hand on the table she did not get the impression of a continuous plane. But if she stroked the surface of the table with her open hand so that the nerve endings concerned were excited by extra stimuli, she experienced a continuity of sensation and the plane did actually coalesce into an integral impression, including also the parts lying between the fingers.

The 'kaleidoscopic' nature of her consecutive impressions becomes understandable on the same grounds; as she did not experience any connexion between the details at any given moment she was, of course, unable to gain an impression of feeling one and the same object from various sides in temporal sequence. Consequently, there could be no question of consistent form in the object felt.

Thus, the failure of the subject to synthesize the simultaneous and successive touch impressions was easily explained by the reduction of auto-sensations and, therefore, by a mere disturbance of sensibility.

The second main characteristic of her blunders in stereognosis—the failure to distinguish contours—scarcely gave rise to any difficulties of interpretation with regard to the actual anomalies of her sensibility. The explanation rests, as will presently be seen, chiefly upon the disturbance of kinaesthesis, though the reduction of tactile auto-sensations will prove, even in this respect, to deserve some consideration.

The function of *kinaesthetic sensations* is brought out very clearly by an illusion cited by E. H. Weber(3), which he describes as follows: "Shut your eyes and let the hand rest well supported. A flat piece of glass pressed first gently, then harder, then again gently against the fingertips seems to have a convex surface; but if it is pressed first hard, then gently, and then again hard, it seems to be concave."

Changes in the intensity of pressure while the hand is still, i.e. while the kinaesthetic sensations remain unaltered, are, according to this, conceived as being conditioned by the form of the object concerned—they are "objectivized". A tendency to "over-objectivization" is, therefore, to be expected when, as a result of kinaesthetic disturbance, the actual movements made in the process of touching cannot be perceived.

If we consider this circumstance together with the state of the subject's tactile auto-sensations, we arrive at the following explanation of her failure to distinguish contours. If, when enclosing an object with her fingers, she intensified the pressure exercised without being aware of so doing (on account of her kinaesthetic disturbance), she experienced the increased pressure as 'objective', i.e. she interpreted it as a protuberance of the object. But, as the spot in question showed no tendency to extend itself beyond the place of direct contact, she did not interpret it as a convex plane, as in Weber's experiment, but as a corner. If she then, while still conscious of this increased pressure, moved across the plane, the result might be the impression of an edge. Indeed, as she was only aware of strips when she simply laid her hand on the table, it was only a short step to perceive edges. As an edge showed no more tendency than

the plane to extend itself, it could also be interpreted as a corner. And as all the elements of form approximated in this way, the opposite transformations could, of course, just as easily occur.

On the same grounds it is understandable that one impression could turn so abruptly into another; it needed only an unintentional alteration in the pressure exercised, e.g. an unconscious loosening of her usually rather convulsive grip, to change the impression of a corner into that of a flat surface or even a cavity. In the same way the impression of size necessarily varied with the changing extent of the surfaces which were being directly touched at any time.

Thus, the confusion of planes, edges and corners, and the tendency to abrupt changes in the impressions, are to a very large extent conditioned by the errors in *objectivization*; these, in turn, are traceable chiefly to *kinaesthetic* disturbance, though presumably also to the state of sensibility in general; the modifications of the *tactile auto-sensations* are also to a certain degree responsible for the lack of differentiation between the elements of form, though their function, here, has not so great a range as in the case of the conception of the integral form.

The impression of 'cotton wool' surrounding the object can also be traced to the change in the auto-sensations; it is significant that this 'cotton wool' actually seemed to appertain to the left hand itself when this was being used to feel the sound right hand. And finally we can explain in this way why every attempt to reproduce in the uninjured right hand the impression gained by the left hand, by wrapping up the objects presented, etc., inevitably met with failure; for in these circumstances only the effect of *external* stimuli could be modified or warded off, whereas the *auto-sensations* still remained uninfluenced.

This was the explanation of the essential characteristics of our subject's astereognosis. Certain changes in her performance level which were observed during the course of the investigation fitted in at once with the interpretation here presented and provided further confirmation of it.

IV. CONCLUSIONS

The conclusion, then, with regard to the psychology of normal stereognosis is that *tactile auto-sensations play as important a part in the construction of the outer world of touch as the tactile sensations brought about by contact with the external object.* Consequently, correct *objectivization* acquires a new significance: not only in the sense of adequate interpretation of changes in pressure but—even before that—in the sense of *demarcation of the object-conditioned from the body-conditioned sensa-*

tions; in other words, it is a question of the correct realization of the figure-ground-relationship, so familiar in optics, which, in the haptic sphere, finds an exact parallel in the *figure of touch standing out against the ground of auto-sensations.*

Moreover, this conclusion implicitly offers a new point of view by which in future stereognostic disturbances will have to be tested before they can be regarded as cases of 'pure' tactile agnosia: the consequences of raising the threshold will have to be taken into consideration also with regard to the response to *inner* stimulation if the influence of simple disturbances of sensibility on the actual level of performance is to be gauged correctly.

Ultimately, a side-light is thrown on the question of psycho-physical relationship and on the limits of its extent. Our subject, who had sustained a lesion of the brain, seemed to give evidence of a failure of some higher function, i.e. of the ability to synthesize sense data or to 'conceive wholeness'. It might have seemed tempting to assume a *direct* interdependence of that disturbance on the cerebral lesion, thereby implying that higher psychic functions as such may be localized in the cortex. Close analysis of the case, however, showed that all the phenomena apparently indicative of a disturbance of higher functions were, without exception, ultimately to be explained by a mere raising of thresholds. This case of astereognosia, therefore, offers no support whatever to the assumption of a psycho-physical process conveying more than mere sensory qualities.[1] This certainly does not refute the possibility of a localization of higher functions in the brain, but it does seem remarkable that a case apparently so characteristic of disturbance of higher function can, on close examination, be completely explained by recourse to mere changes in the sensibility.

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[1] In the motor sphere, physiological mechanisms localized in the cerebral cortex have to be assumed. F. M. R. Walshe, in a paper on the subject of cerebral localization (4), points out very clearly how this may be conceived.

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FACTORS IN INTROVERSION AND EXTRAVERSION

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I. *Introduction* (p. 335).
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I. Introduction

After giving a list of tests which claim to measure introversion-extraversion, Cattell ((1), (2), (3)) comments on it as follows: "The consistency of each of these tests with itself leaves nothing to be criticized, yielding a coefficient near 0·8 in most cases. With one another, however, their agreement is frequently negligible." And he adds: "Apart from the subject's poor knowledge of his own standing (most people think themselves introverts) and from questions of conscious and unconscious honesty...the fact stands out that the authors have not troubled to prove that the clusters of qualities which they attempt to assess are in fact correlated to form an 'introvert' type." Cattell's own view is that introversion is not a unitary character but is a compound involving two independent bipolar factors. The first of them he has described at some length and named surgency-desurgency. The second he has called '*a*', for adjustment, and it appears in a group of traits including frankness as opposed to secretiveness, balanced outlook as opposed to extremeness, objectivity as opposed to subjectivity. He suggests further that this second factor may be related to perseveration, and maintains that there is some connexion of high perseveration with introversion, although there is none with desurgency.

This view, although it seems to be on the right lines, obviously requires further analysis, and the enquiry which is reported here is an endeavour to carry the matter a stage further.

II. The qualities analysed

In an article published in 1924 Freyd (4) made a collection of fifty-four traits commonly regarded as characteristic of introversion, and in 1926 Heidbreder (5) attempted to arrange these in order of diagnostic value. From her list we have taken the first ten items, used them to form a self-rating questionnaire, and to each quality attached a uniform five-point scale of marking. The method of administration was as follows. The subjects, taken in groups, had the first quality described to them orally as well as the nature of the scale according to which they were to assess themselves. This explanation was given fairly fully, and the scale of marking was gone over twice before any judgments were recorded. When all the assessments had been made on the first quality, the second quality was dealt with in the same fashion, and so were all the others in their turn.

Although the subjects were not informed that there was any reason to believe that the different qualities in the questionnaire were inter-related, care was nevertheless taken to prevent the mark supposed to indicate introversion from coming always at the same end of the scale. For example, in the first question the 'extreme introvert' would obtain a mark of 1, and the 'extreme extravert' a mark of 5; whereas in the second question the arrangement was reversed. Accordingly in the following list the qualities involved are not described uniformly from the point of view of either introversion or extraversion, but are described as they were presented to the subjects.

1. Makes friends easily.
2. Is easily hurt by remarks or actions of others.
3. Is not suspicious of the motives of others.
4. Does not worry about possible misfortunes.
5. Indulges in self pity when things go wrong.
6. Keeps his head in excitement and moments of stress.
7. Takes prominent part in social affairs and entertainments.
8. Is outspoken, blunt, critical.
9. Prefers working with others.
10. Is subject to changes of mood without apparent cause.

The questionnaire was applied by one experimenter to 115 undergraduate students of psychology, and so far as it is possible to judge a high degree of co-operation was secured. A perseveration test of three items taken from Cattell ((3), pp. 216–17) was given to seventy-six of the subjects.

III. Results obtained

The resulting scores were intercorrelated and gave the results shown in Table I. In this table, however, the signs attached to three of the variables, viz. nos. 4, 6 and 8, have been reversed, and in the following discussion these qualities have to be interpreted in the sense opposite to that given in the list above. That is to say, their new meanings are:

4. Worries about possible misfortunes.
6. Is easily rattled, loses his head in excitement, etc.
8. Does not criticize others and is careful of their feelings.

Table I. *Correlation table*

	1	2	3	4	5	6	7	8	9	10	'*p*'
1	—	067	007	−143	−054	029	400	083	289	018	−035
2	067	—	027	281	216	053	001	184	059	247	054
3	007	027	—	−028	−050	078	062	134	163	−253	090
4	−143	281	−028	—	302	163	−171	083	−086	096	150
5	−054	216	−050	302	—	331	−148	175	026	282	−054
6	029	053	078	163	331	—	−043	−014	112	158	−104
7	400	001	062	−171	−148	−043	—	−094	534	−128	186
8	083	184	134	083	175	−014	−094	—	092	−068	235
9	289	059	163	−086	026	112	534	092	—	−170	−179
10	018	247	−253	096	282	158	−128	−068	−170	—	193
'*p*'	−035	054	090	150	−054	−104	186	235	−179	193	—

(Decimal points omitted.)

The correlations are not high, the average, taken irrespective of sign, being only 0·136, with a probable error of 0·062; but in view of the number of larger correlations which the table contains we deemed it advisable to submit it to analysis. Thurstone's centroid method was used, and four factors had to be extracted before the residuals were reduced sufficiently to be attributable to chance. The centroid matrix is given in Table II.

Table II. *Centroid matrix*

	I	II	III	IV	h^2
1	0·2601	−0·3898	−0·1787	0·1312	0·2687
2	0·4782	0·1932	−0·0631	0·0190	0·2703
3	0·0899	−0·1294	0·2034	−0·2316	0·1198
4	0·2399	0·4458	0·0682	0·0589	0·2644
5	0·4419	0·3980	0·2529	0·2675	0·4892
6	0·2932	0·0760	0·2563	0·2506	0·2202
7	0·2245	−0·6085	−0·3279	0·1091	0·5401
8	0·2987	0·0664	0·0290	−0·2775	0·1715
9	0·4143	−0·6303	0·3087	0·2087	0·7078
10	0·1526	0·4322	−0·4213	0·3970	0·5452
'*p*'	0·2203	0·0780	−0·2358	−0·3589	0·2390

IV. Rotation of centroid matrix

In an article previously published in this *Journal* (6) we described four temperament or character factors involved in a portion of Webb's well-known data. One of these we named perseverance, and although it is akin to Webb's own factor '*w*' it differs from it in two ways. On the one hand we interpreted the factor in a simpler and more elementary way than Webb does, laying less emphasis on the voluntary aspect which Webb regards as essential. And on the other hand we gave it a wider scope, making it include emotional stability as well as conative persistence. Another factor, which we indicated by the antithesis of light-heartedness and serious-mindedness, has a close resemblance to Cattell's surgency-desurgency, and may perhaps be identical with it.

These two qualities or factors seem relevant to the present analysis. The tenth item in the questionnaire deals directly with variability of mood, that is to say, with the affective aspect of perseverance as we interpret it, measured from the negative end. We decided, therefore, to use it as a guide in locating the first axis, but in order to give the factor thus derived the same meaning as it had in our previous article, we reversed the signs of item 10 in the centroid matrix, a process which has the effect of measuring the quality from the positive instead of from the negative end and giving it the significance of perseverance and stability rather than of instability. Thus we began the rotation by locating the first axis in such a way that the projection on it of item 10, thus reversed, would be a maximum. We then considered that item 5 is probably heavily loaded with serious-mindedness and can be used to place the second axis. Well-known methods of rotation were employed. Taking the centroid matrix as defining a set of vectors in a four-dimensional space, we rotated the axes orthogonally until the first one ran in the same direction as vector 10, in its new interpretation, and the second in the same direction as the residual vector of 5. This left us with two axes to place, and we found that if we made one of them coincide with the vector '*p*' the other coincided almost exactly with vectors 1 and 7. We therefore chose these positions, and using the orthogonal transformation given in Table III we obtained the factorial matrix shown in Table IV.

Table III. *Transformation matrix*

I	II	III	IV
−0·2067	0·6048	0·5689	0·5177
−0·5854	0·3363	−0·7194	0·1639
0·5706	0·7061	−0·2163	−0·3595
−0·5376	0·1507	0·3350	−0·7591

Table IV. *Factorial matrix*

	I	II	III	IV
1. Makes friends easily	0·0019	−0·0802	0·5110	0·0354
2. Is easily hurt	−0·2582	0·3125	0·1531	0·2876
3. Is not suspicious of motives	0·2977	0·1196	0·0227	0·1280
4. Worries about possible misfortunes	−0·3033	0·3520	−0·1792	0·1280
5. Indulges in self-pity	−0·3238	0·6200	0·0000	0·0000
6. Loses his head in excitement	−0·0936	0·4216	0·1406	−0·1181
7. Takes prominent part in social affairs	0·0641	−0·2839	0·6729	0·0516
8. Is careful of feelings of others	0·0651	0·1816	0·0229	0·3657
9. Prefers working with others	0·3473	0·2880	0·6923	−0·1582
10. Is persevering and stable	0·7384	0·0000	0·0000	0·0000
11. Perseverates	−0·0328	−0·0611	0·0000	0·4840

V. Interpretation of the factors

We may now consider the factors thus isolated. In view of the error which is inevitably incorporated in the matrix, it seems unwise to treat as significant any saturation coefficient less than 0·2, and for the purpose of defining a factor even higher coefficients than this are desirable.

1. The first factor has a positive load in three of the variables, viz. 10, *is persevering and stable*, 9, *prefers working with others*, and 3, *is not suspicious of motives*. It has negative loads in 5, *indulges in self-pity*, 4, *worries about possible misfortunes*, and 2, *is easily hurt*. These factor loadings seem consistent with the conception of perseverance as described in our previous article. The quality is essentially emotional and conative stability.

2. The second factor has positive loads in 5, *indulges in self-pity*, 6, *loses his head in excitement*, 4, *worries about possible misfortunes*, 2, *is easily hurt*, and 9, *prefers working with others*. It has a negative load in 7, *takes prominent part in social affairs*. The qualities involved here do not overlap to any large extent the qualities, taken from Webb's list, by means of which we described the antithesis between serious-mindedness and light-heartedness in our previous article. But so far as we can see the two analyses are consistent with one another, and the factor may well be identical in the two cases. Moreover, the factor as it emerges here seems virtually identical with Cattell's desurgency. Cattell has a wider range of epithets to describe the factor than our data allow us to use, but, so far as it goes, our analysis agrees with his, provided that the unsociable character of the desurgent subject which Cattell emphasizes is not identified with an inability to make friends but merely with a dislike for the stir and confusion of social entertainments.

3. The third factor has only three definitely significant loads, viz. 9, *prefers working with others*, 7, *takes prominent part in social affairs*, and 1, *makes friends easily*. It may be called sociability.

4. The fourth factor is of interest. It is defined largely by the perseveration tests, which have a load of 0·48, the other two significant loads being in 8, *is careful of the feelings of others*, and 2, *is easily hurt*. These latter two traits obviously have an interconnexion, some of which is due to the second factor; most, however, is due to this fourth factor which they have in common with perseveration. This result appears to be new. In the literature '*p*' appears as a small, persistent but elusive factor, the functional importance of which has not been clearly determined. The present analysis does not contain sufficient data to provide a decision, but the suggestion it offers should be followed up.

If this general interpretation is sound, it affords confirmation of Cattell's view that introversion and its opposite, extraversion, are not unitary characteristics. Further, it supports his argument that surgency-desurgency is one of the factors involved. But instead of accounting for the remainder by one further factor, it offers three. What Cattell calls adaptation is itself a compound, involving persistence or stability, sociability, and a form of social toughness or tenderness which in some as yet unexplained way is correlated with '*p*'.

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A FACTORIAL STUDY OF MUSICAL TESTS

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I. *Present problem and previous inquiries* (pp. 341–344).
II. *The tests and the persons tested* (pp. 344–345).
III. *Reliability and validity of the tests* (p. 346).
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I. Present problem and previous inquiries

The primary object of the following research is to examine the hypothesis of a general factor for musical ability and to explore the influence of more specialized factors such as might obscure this general factor or interfere with its measurement. The purpose with which I originally set out was to devise a set of practicable tests for estimating the musical ability of school children, with a view (i) to improving the present methods of selecting pupils for musical education and for a musical career, and (ii) to studying the development of musical appreciation among children generally, particularly in relation to age and educational level.[1] Older tests, such as those of Seashore (2) and Kwalwasser (3), are recognized as inadequate for such purposes; neither the constructors nor their followers attempted to validate the material or the methods employed by any systematic statistical analysis, such as has long been used for evaluating mental and scholastic tests in other fields. Moreover, their tests do not deal with the essential aesthetic element involved in musical appreciation, but are concerned chiefly with the simpler perceptual processes or with the knowledge of musical technicalities acquired in school or elsewhere.

To test capacity for appreciation, as distinct from executive skill or technical knowledge, may seem an elusive and ambitious aim. Nevertheless, in the long series of co-operative researches planned some years ago by Prof. Burt and carried out in

[1] My experiments were started in 1933, and the earlier work was fully described in my M.A. thesis on "Tests of musical ability in school children" (1). A short preliminary account was also published in "The measurement of musical appreciation", *St Bartholomew's Hospital Journal*, May 1939.

the same laboratory by various research students ((7), (8), (9), (14), (17)) considerable progress has already been made with the more general problems of aesthetic ability; and, in several of the researches, tests and assessments of musical appreciation, as well as of appreciation of literature and art, were successfully employed. As early as 1925, on factorizing tested abilities among school children and students, Burt reported evidence for "a group factor for music", i.e. "a distinct and special musical capacity, no doubt highly complex" ((4), p. 20; (5), p. 42). But, probably because tests of literary and pictorial appreciation are so much easier and speedier to apply, most of the investigations since published have been more concerned with them. The present paper, I believe, is the first published attempt at a full and detailed examination of the problem of musical ability by the factorial methods that have been so successfully used in other branches of mental testing.

The experimental and the statistical techniques here adopted follow much the same lines as those laid down in these earlier inquiries, but (as will appear later on) includes several important amendments. As regards the experimental procedure, Burt has strongly urged that, instead of the elementary processes of auditory discrimination to which the tests of Seashore and others are mainly confined, any tests of musical ability that deserve the name should embrace the more concrete and complex processes, such as are involved in ordinary listening and, incidentally, require no special laboratory apparatus. The gramophone tests of Seashore and Kwalwasser have been in regular use at the psychological laboratory, University College, for over ten years. Their reliability proves to be by no means high, averaging barely 0·64. Their raw correlations with independent estimates of musical ability are decidedly low, between 0·25 and 0·40; and, as he observes, these figures are no evidence that the tests measure musical ability as such ("their net correlations, when intelligence is partialled out, are little over 0·10 and therefore, with the groups tested, statistically insignificant").

Though one would hardly guess it from the tests introduced by psychologists, the theory of music during the past century or so has aimed at a scientific account of the chief aspects of musical expression; and accordingly Burt's proposal was to test appreciation for each of these aspects systematically in turn.[1] At the same time he insisted that the principles implied by the choice and marking of the test problems should be consistent with the practice of modern as well as of classical music. As he points out, "the tests of consonance, cadence, and the like adopted by most psychologists rest on principles which would condemn half the post-war compositions, and are entirely out of keeping with the style of music to which the younger generation has become accustomed"(6). The form of the tests was based largely on analogy with the

[1] A systematic study of musical appreciation along these lines, with elaborations of Burt's earlier tests, was begun at the same laboratory some years ago by Miss Mary Wright (cf. (9), p. 265); but her return to Canada prevented the study being carried to a completion. I have, however, profited by unpublished accounts of these and other preliminary studies in which somewhat similar tests and statistical analyses have been adopted. As regards general principles, analogous views have been expressed by Dr Semeonoff in his recent papers on "A new approach to the testing of musical ability"(18); but, as will be seen from my earlier thesis (1), I myself had already adopted these conclusions before his work was published. A brief but admirable review of the literature is given in Vernon's chapter on aesthetic tests (16).

main types of test that had proved successful in other fields; and the material was largely suggested by the exercises commonly set in ordinary musical examinations or text-books, considerably simplified and standardized. The tests proposed included appreciation of rhythm, of melody, of harmony, of chord progressions and of cadences, detecting appropriate or inappropriate instances of each, noting faults of execution, assigning the best titles, drawing up the best critical comments, 'programmes', and emotional descriptions, ranking tunes (either heard or referred to by title) according to relative merit. As actually worked out, they were admittedly imperfect, and their reliability coefficients often low (0·60 to 0·75). But these preliminary results demonstrated at least three things: "first, the importance of a systematic review of the theoretical principles on which musical tests should be constructed; secondly, the superiority of testing the more natural and more complex types of listening; and thirdly the value of assessing not only the individual's *general* capacity for musical appreciation, but also the particular *type* of musical appreciation in which he is weak or strong(6)."

My own investigations, based on many years' experience, have tended to confirm these general assumptions. But the tests I have used are to a large extent original, and, as judged by the statistical results, can now claim a much higher reliability and validity than those previously used. In addition, they are at once easier and more uniform in application, since in their final shape they can now be given by *specially prepared gramophone records.*

For a statistical analysis of the data so collected I have used the modified factorial technique which has been elaborated by Burt for similar studies in these and other fields of aesthetic activity(15). The earlier account of my work has been criticized by musicians on the ground that "music is far too spiritual a thing to be measured, as we measure physical lengths or the weights of meat and metals: hence statistical methods are inapplicable". In reply I would briefly point out that the view of mental measurement which such statements imply is far too narrow. "Measurement may imply one or both of two fundamental postulates: the things to be 'measured' may be arranged in order, so that (i) of any two items, x and y, we may always postulate $x>$, $=$, or $<y$; (ii) of the *differences* between any two items we may also postulate $(x-y)>$, $=$, or $<(y-z)$."[1] Now the measurement of lengths and weights implies (ii) as well as (i); but for the measurement of aesthetic qualities, e.g. musical abilities or musical compositions, only (i) is necessary. The criticism therefore rests on the false assumption that all measurement is necessarily additive measurement.

I take this opportunity of recording my gratitude to the numerous persons who have aided me in so many different ways. To Prof. Burt I am deeply grateful, not only for guidance in regard to the general design of the inquiry on its statistical side, but also for many other suggestions which he has made, based either on his own work or on that of other research students who have worked under him in the same or similar fields. To Prof. Hamley I am indebted for much assistance on the educational aspects of the problem, especially during the earlier stages of my inquiry. I owe a further debt of gratitude to many eminent musicians, particularly to Sir Percy Buck, Mr Cyril Winn (Chief Inspector of Music), Dr Geoffrey Shaw, as well as to Prof. J. C. Flugel, Dr C. S. Myers, and numerous psychologists and students of psychology who have

[1] The statement is Burt's. For a fuller discussion see his section on "The postulates of mental measurement" ((15), pp. 115 *et seq.*).

been good enough to submit themselves to my tests, and to the teachers, pupils, and others who either allowed themselves to be tested or assisted me in making arrangements for testing their classes or their colleges.

II. The tests and the persons tested

The data analysed in the present paper are derived from seven of the more reliable tests. In their final form they are the outcome of over eight years' elaboration and revision. The test material has been recorded on nine 10 in. gramophone records specially prepared for the purpose. Duplicates of the records can be obtained on loan on application to the writer. I have to acknowledge the generosity of the University of London in contributing a grant from its Research Fund towards the expense of making these discs.

The test problems are designed so that they require no special knowledge of musical technicalities, and, within each test, are graded in difficulty, so that the easiest are suitable for children of eight, and the hardest may tax the capacities of a professional expert. The whole takes almost exactly an hour to apply. Full details of the tests, with instructions, key, and passages in musical notation, will be published elsewhere. To save space, the following enumeration must here suffice. The seven best tests involve the following tasks:

1. Detecting the number of notes played on a single chord (occasionally the 'chord' may consist of one note only).
2. Detecting the change of a single note in a repeated chord.
3. Detecting changes of notes in a short melodic phrase.
4. Judging the more appropriate rhythmic accentuation in two versions of the same melody.
5. Judging the more appropriate of two harmonized versions of the same melody.
6. Judging the more appropriate mode of varying loudness (*crescendo, decrescendo, sforzando*, etc.) in two versions of the same melody.
7. Judging the more appropriate phrasing (grouping of notes by pauses) in two versions of a melody.

The melodic extracts are quite short—usually consisting of eight bars only. In each test there are as a rule twenty such items. In addition to the foregoing, which I shall call the 'final series', a number of other tests were used with many of the groups. In the earlier stages of the inquiry these served the purpose of discovering what type of test would yield the highest correlations, and threw further light on the mental processes involved and on particular aspects of the musical abilities or knowledge of the persons tested. In addition, a dozen tests were given to some of the groups by means of a piano; others were also included which did not necessarily involve listening to music: e.g. writing down unfamiliar melodies from dictation, writing down a well-known tune such as the National Anthem, arranging a given list of familiar tunes in

order of preference,[1] etc. Most of the pupils also answered a questionnaire (somewhat similar to that of Kwalwasser) on their knowledge of musical symbols and on their musical interests, musical training, opportunities for listening to music out of school, e.g. over the wireless or at concerts.

3615 children have been personally tested. These have been drawn from various parts of the country. Small groups were also tested in Germany. In standardizing the final records, over 2000 boys and girls were used, ranging in age from 8 to 18, and drawn mainly from London schools of various types—elementary, senior, selective central, and secondary. In addition about 300 adults (chiefly students at University College, London, or University College, Wales) have been tested with the assistance of two research students engaged on similar work.[2]

As was only to be expected, the questionnaires disclosed wide individual differences both in musical training and in musical experience. This made it doubly important to rule out, so far as possible, the influence of acquired musical knowledge. The duller children, the average children, and the brighter members of each group were accordingly subjected to a separate analysis from this standpoint; and, although the numbers were large, no significant differences were found in any section between the percentages of correct answers obtained from those who had enjoyed considerable musical training, and those who had enjoyed little or no training and possessed little or no acquaintance with good music. It thus would seem that the tests finally selected are not discernibly affected by musical acquirements.

[1] Though naturally less reliable than tests based on actual records, this simple test is full of suggestive possibilities which might be exploited by those who have no special apparatus or instrumental facilities at their command. It was one of the earliest used by Burt in his work on aesthetic types. Parallel with his test of arranging pictures, poems, literary extracts, etc., in order of merit, he drew up lists of familiar tunes to be similarly arranged in order of personal preference by the examinees. The primary object was not merely to gauge the general level of the examinee's appreciation, but also, by 'correlating persons', to investigate and measure his approximation to the ideal order of preference characterizing this or that 'type' (e.g. 'classical' *versus* 'romantic', 'rhythmic' *versus* 'melodic' or 'harmonic', 'abstract' *versus* 'sentimental', etc.). In the investigations so far undertaken I have used only the list drawn up for elementary school children, and have confined myself mainly to the former problem: on the question of types see section IV, (ii) and (iii) below.

[2] I have to acknowledge my indebtedness to Prof. Idwal Jones and Prof. Burt for arranging these tests to be taken by students at University College, London, and (after the evacuation of the department) by the Welsh and English students at Aberystwyth; also to Miss Davidson, Miss Slade, and others, who not only undertook the administration of the tests, but also made some preliminary analysis of the data with a view to checking alleged racial differences.

III. Reliability and validity of the tests

The seven tests in the final series were repeated with two small groups. Their reliability proves to be 0·91 with one group (43 boys) and 0·92 with another (39 boys). With the latter group the longer series of tests was also taken twice. For these the reliability was slightly higher, namely, 0·95. The short series of seven tests correlated with the longer series of thirteen to the extent of 0·97. But little, therefore, is gained by prolonging the tests. It may be added that tests based on the gramophone records correlated to the extent of 0·95 with tests in which a piano was used.

Except where the children happened to be learning some musical instrument, it was, as a rule, by no means easy to obtain trustworthy independent estimates of musical abilities from the teachers. For three groups, however, satisfactory rankings were procured. With these the preliminary form of the tests showed a correlation of 0·64, and the final form correlations of 0·78 and 0·82.

When the same tests were repeated within an interval of a week, there was a small improvement, adding about 4 % to the average marks. When the repetitions were separated by an interval of 12 months, hardly any improvement attributable to the previous testing could be discerned. Even when pupils had continued their musical education for a year or more, the instruction received was followed by no perceptible improvement in the later test performances over and above what the untrained pupils also showed, presumably as a result of general mental development during the period. In the supplementary tests of musical knowledge and the like, distinct progress was manifest; and throughout, of course, there was a steady improvement with increasing age and intelligence.

IV. The results of a factor analysis

In correlating the marks and factorizing the correlations it seemed essential to deal separately with the different groups. Space will not allow me to print all the tables thus obtained; they will, however, be found in my thesis. Here I shall confine myself to an illustrative analysis of a single table only. This is based on a small group of forty-three older boys, aged 14–16. The group is chosen because it is the largest to which all the tests have been applied at least twice. The repetition increases the reliability of the test results and gives a wider range to the marking. Correlations between other groups have been analysed in much the same way. So far as the main conclusions are concerned, the data appear

entirely concordant. Thus inferences which could claim little statistical significance if based on one small group alone acquire greatly enhanced credibility when found appearing and reappearing in other groups as well.

For this particular group the correlations between the seven tests are shown in Table I. Since the probable errors range from $\pm 0{\cdot}06$ to $\pm 0{\cdot}10$, all except the smallest coefficients are significant. The correlations were factorized by the methods of 'simple summation' and 'weighted summation' respectively as described by Burt ((15), Appendix I). If suitable communalities or 'variances' are inserted in the leading diagonal of the matrix, it is possible to analyse the intercorrelations between the seven tests in terms of four factors only. The communalities reached by successive approximation are shown in brackets in Table I. The saturation coefficients for the three main factors, as obtained by simple summation, are shown in Table II.

Table I. *Correlations between tests*

Test	7	1	2	3	5	6	4
(7) Judging best phrasing	(0·746)	0·298	0·510	0·291	0·517	0·598	0·430
(1) Detecting number of notes in chord	0·298	(0·652)	0·509	0·588	0·491	0·362	0·119
(2) Detecting change of notes in chord	0·510	0·509	(0·505)	0·567	0·388	0·344	0·136
(3) Detecting change of notes in melody	0·291	0·588	0·567	(0·779)	0·317	0·180	0·060
(5) Judging best harmony	0·517	0·491	0·388	0·317	(0·481)	0·338	0·293
(6) Judging best loudness	0·598	0·362	0·344	0·180	0·338	(0·471)	0·443
(4) Judging best rhythm	0·430	0·119	0·136	0·060	0·293	0·443	(0·383)

Table II. *Saturation coefficients*

Test	Factor (i)	Factor (ii)	Factor (iii)
(7) Judging best phrasing	0·765	0·354	−0·180
(1) Detecting number of notes in chord	0·681	−0·341	0·268
(2) Detecting change of notes in chord	0·669	−0·220	−0·094
(3) Detecting change of notes in melody	0·629	−0·595	−0·174
(5) Judging best harmony	0·638	0·058	0·267
(6) Judging best loudness	0·618	0·292	−0·065
(4) Judging best rhythm	0·421	0·452	−0·022
Average of saturation coefficients	0·632	0·000	0·000
Average of squares of saturation coefficients	0·408	0·134	0·031

Burt's procedure differs from others chiefly in his view of the communalities ('variances' or 'self-correlations'). The estimated test variance he regards, not merely as the sum of the squares of the factor saturations, but as itself the square of an estimated factor saturation, namely, the saturation of the test with *all* the common factors represented in the battery, or, in other words, as the square of the multiple correlation of the test with an infinite number of tests representing the same common factors. Stephenson and others who have criticized these assumptions argue that it is erroneous to suppose that the variances of the tests really differ in any assignable way

amongst themselves. The only safe procedure, they maintain, is to assume that all the variances are equal, and to equate each of them with unity. But, even if we accept these alternative assumptions, the essential results here remain unchanged. On inserting 1·00 throughout the leading diagonal of the correlation table, we necessarily obtain slightly different figures; and in my thesis I have fully analysed this alternative form of the correlation matrix: the method of 'weighted summation' was employed, and the computations abridged by adopting Burt's device of summing a geometrical progression instead of repeated iterations.

With a large correlation matrix, the method of 'simple summation' yields coefficients similar to those furnished by Thurstone's 'centroid' method; and the particular form of 'weighted summation' here employed yields coefficients virtually identical with those obtained by Hotelling's method of 'principal components'. In the latter case, however, the correlation matrix cannot be completely accounted for by less than seven factors, i.e. by a number of factors which is identical with the number of tests employed. But evidently the last three or four factors are due primarily to the fact that the variance of each test has been raised to unity; they are therefore of very doubtful significance. In any case, with groups of the size here tested only two or three factors at most can claim any measure of statistical significance; and no matter which of the two methods is employed, for the first four factors the arrangement of the signs, and, indeed, the relative size of most of the coefficients, turn out to be practically the same. The main effect of inserting unity into the leading diagonal is simply to enlarge the absolute magnitude of the saturation coefficients, though, of course, it is not enlarged so much as the total variance. Taking the total variance to be 7·00 (as the second method requires) the first factor accounts for 41%, the second for only 13%, and the third for barely 3%. If we take the total variance to be the sum of the complete communality (as the first method requires), the first factor accounts for over 70%.

(i) *The first factor.* Whichever form of analysis we adopt, the first factor is responsible for far more of the total variance than any other single factor; moreover, its saturation coefficients are positive throughout. These two facts are sufficient to justify the assumption that all seven tests may be treated as depending upon a single common factor, which we may here briefly designate 'general musical ability' (μ). The name does not, of course, imply that the 'ability' is a simple capacity or faculty: no doubt it is highly complex. Nevertheless, the results allow us to regard our various tests as primarily testing one and the same group of mental processes.

Whether or not there is a 'group factor' underlying musical appreciation is a question that has been answered in the past in two opposite ways. On the basis of his investigations among L.C.C. school children, Burt concluded that a "special or group factor for musical ability existed" over and above the general factor for intelligence ((4), p. 20; cf. (5), p. 42). On the other hand, Spearman a year or two later brought forward reasons for doubting this as well as other group factors. "So

far", he writes, "no analogous broad factor has presented itself elsewhere. Most of all, perhaps, it might have been expected in the sphere of music, where not only innate instinct but also environmental encouragement are incomparably more favourable for some individuals than for others. And yet just here the existence of the expected broad factor has been convincingly disproved; the abilities to appreciate, for instance, the relations of pitch, loudness, and rhythm have extremely low intercorrelations; no more, in fact, than must be attributed to *g* alone" ((11), p. 340). On a later page, he seems disposed to attribute any apparent "unitariness presented by musical ability", together with most other "special abilities", to "past experience rather than to native aptitude" ((11), p. 242).

The mere fact that a positive factor is found running through all the seven tests here employed does not, of course, suffice to prove that musical ability is entirely distinct from general intelligence. That is a problem that I shall take up more fully on another occasion. Here I may briefly say that in many of the schools the pupils were tested for other cognitive abilities besides musical appreciation, and that the further correlations seem plainly to show that, although success in the musical tests depends in part on general intelligence, nevertheless there is a large group factor operating in addition which would appear to be fairly specialized. The correlation of ability in the musical tests with general intelligence is positive but low, namely, 0·32 with Burt's Reasoning Tests and 0·30 with the Simplex Junior Test. We may, therefore, legitimately conclude that the correlation of the tests with *g* cannot account for more than one-sixth of their correlation with each other. This seems in keeping with the results obtained by Lowery (20), as well as with those of Burt (6), (9).

As regards the efficiency of the individual tests there seems no very great difference. The best is undoubtedly the test of 'phrasing', which has a saturation coefficient of nearly 0·80. That is quite intelligible; for the surest sign that one has understood a new musical piece is one's ability to grasp its formal structure, just as the surest sign that a child understands a strange passage that he is reading aloud is the fact that he phrases the passage in the way that its logical and grammatical structure demands. The only test with a saturation coefficient below 0·6 is that which requires the listener to recognize the better mode of accentuating the rhythm of a piece. Of all musical capacities the ability to recognize rhythm is probably the most elementary: it develops early, is the most widely diffused, and, as other inquiries would seem to indicate, may exist in almost complete independence of any deeper appreciation of higher developments of musical art, e.g. melodic pattern and harmony (cf. Burt, ap. Board of Education, *Report of the Primary School*, p. 284). We may infer, therefore, that it requires and implies no very high level of musical capacity. As for the remainder of the tests, the introspections obtained at various stages of the research suggest that their order of efficiency corresponds very closely with the order of the difficulty which each test presents to the average (and therefore relatively unmusical) listener; thus, the tests which the less musical find hardest appear to be the best for picking out the more musical.

(ii) *The second factor.* Judged by the χ^2 test ((15), p. 339) the remaining factors could scarcely claim statistical significance, were we restricted to this group of pupils alone. Limitations of space forbid printing similar tables for other groups: but with them the analysis also reveals two supplementary factors subdividing the tests in precisely the same way as that shown in Table II. When a summation method is used, such supplementary factors are necessarily bipolar: but, by applying the method of unimodular transformation ((15), p. 304), we can, if we prefer, convert the bipolar factors into positive group factors. The interpretation remains unaltered.

The second factor, it will be seen, divides the seven tests into two sub-classes. The first includes all those tests in which the essential task of the listener is to *judge* the more appropriate musical arrangement—i.e. to decide the better phrasing, the better rhythmical accentuation, *crescendo*, or *decrescendo*, or (though here the coefficient is much smaller) the better harmonization of a melody; the second group comprises the three remaining tests in which the task is merely to *perceive* a change—i.e. to detect any alteration in a melody, in a chord, or in the number of notes played simultaneously.

Here once again the introspections plainly reveal the true nature of the distinction. As Burt points out, it corresponds to two different attitudes that are adopted by certain individuals, naturally and habitually, in listening to music and may at times be deliberately adopted by one and the same listener on different occasions or for different purposes. One subject, for example, reports: "If a composition or even a phrase is new and unfamiliar, I tend actively to concentrate my attention on the interconnection of the several parts, explicitly educing the relations between them; in such a case I catch myself formulating in technical terms the underlying structure—'full close', 'end of first subject', 'bridge passage', 'how is he going to resolve that suspended discord?' But on a second or third hearing, or in listening to a work that is familiar or fairly straightforward, my attention is more diffuse. I let the structural pattern, now implicitly realized, affect me as a single continuous whole... I no longer educe relations: I submit myself to the Gestalt." The low saturation for the test of harmony is in keeping with this view, since (as the introspections again reveal) it can be approached in two different ways—on the basis either of a relatively explicit chord-analysis, or of an implicit appreciation of the counterpoint. It is hardly necessary to add that the non-musical do not employ this technical language. Nevertheless, their descriptions often tally quite closely with those of the musically trained.

This factor is thus reminiscent of a similar bipolar factor that has so often emerged in testing both artistic and other intellectual abilities. Early work on intelligence tests showed that there were two ways of dealing with a structural object: one "involves a complex synthetic

activity comparable to the activity popularly described as intuition—the activity whereby we implicitly comprehend the essential meaning or character of a whole without explicitly analysing it into its component parts"; the other depends upon "an analytic activity which consists essentially in explicitly analysing the whole into its component parts", and, where necessary, educing the relations between them.[1] Much the same distinction has been noted again and again in other fields of aesthetic research (cf. (8), p. 36; (9), pp. 274 *et seq.*; and (10), p. 59).

The existence of this factor is here confirmed by an analysis of the correlations between persons. With this technique, in accordance with the so-called 'reciprocity principle', the second (bipolar) factor obtained by correlating tests commonly reappears as the first to be obtained when correlating persons. This occurs on subjecting my own data to the alternative form of factorial analysis: and the results afford further evidence for these two types of aesthetic appreciation.[2]

(iii) *The third factor.* The third factor has appreciable saturations for two tests only, namely, for judging the better harmonization of a melody and detecting the number of notes in chords. These two are the only tests which essentially depend on listening to notes sounded simultaneously. The remainder of the tests, it will be observed, deal mainly with the melodic or rhythmic outline of the music played. We may therefore regard this factor as distinguishing those persons who have a better appreciation for harmony than for melodic or rhythmic line.

I must emphasize that the foregoing is merely a brief and tentative summary of the factorial results that appear to emerge from a first examination of the data collected. But, so far as it goes, it certainly seems in keeping with the theory of aesthetic factors deduced by Burt and others from tests of non-musical as well as of musical abilities. Several of the factors and types that are here distinguished will no doubt turn out to be highly complex, and analysable into more elementary factors. Thus, the interpretation of the first bipolar factor accepted above usually identifies

[1] Burt (19). For the bearing of this on artistic appreciation, cf. (4), p. 346, and the passage quoted *ap.* (9), p. 290.

[2] The analysis of the correlations between persons was undertaken for me by Miss Davies in complete independence of my own analysis; to save space I do not give any further tables here, nor quote any further introspective reports: both will be found in my thesis. I may add that I had not consciously planned to divide my tests initially into two groups, as the names given above might seem to imply. The tests were first chosen for empirical reasons, and the names allotted only after the introspections of psychologists and musicians had been examined. Judging by their accounts of their own mental processes, the natural attitude of the trained musician, at any rate in *appreciating* a passage, is 'synthetic' or 'intuitive', or, as they put it, 'relatively passive'. This seems confirmed by the fact that the best of my tests of musical appreciation is markedly of a 'synthetic' or 'intuitive' type (cf. (7), pp. 306 *et seq.*).

the 'analytic' type with the 'classical', and the 'synthetic' (or Gestalt) type with the impressionistic or 'romantic': but my own evidence implies that the agreement between the two pairs—the one turning largely on a difference in cognitive attitude, the other mainly on a difference in temperamental inclinations—is itself by no means complete. My emphasis on the distinction between cognitive and conative does not imply any belief in a sharp separation between the cognitive and the emotional attitudes. Here the general inferences I should be disposed to draw come rather nearer those of Krueger than of other writers: and it is interesting to note that his views have also been partly reached through the study of auditory and musical experiences, while (as is well known) he was one of the earliest to enter the field of factor-analysis (12) and to interpret general factors in terms of *Gestalten* or (as he would prefer to say) of *Ganzheiten* (13). Again, in the final series, only one test dealing primarily with the appreciation of rhythm was included, since that type of process has a comparatively weak association with general musical ability. With this set of tests, therefore, it was impossible to corroborate the alleged existence of a separate factor for rhythmic appreciation. Lack of space, however, precludes me from discussing these supplementary issues here.

V. The development of musical ability

One of my chief objects was to obtain norms which would enable us to state the average level of musical ability among school children of different ages in terms of the tests here used, and to measure the relative ability of individual pupils. In this attempt a familiar difficulty is encountered. After the age of 11, the general mass of the school population is sorted into two unequal groups. At that age a smaller proportion are drafted to central or secondary schools: in the schools where my testing was done, they comprise, according to the information given to me, nearly 30 % of the total number; the remaining 70 % or more are left behind in the elementary schools. After the age of 14 the only pupils easily accessible are those in schools of a higher type. Between the ages of 11 and 14, therefore, I have given the averages at each year for the separate groups as well as for the total population. Above that age my averages refer to children from the higher type of school alone; below that age I give figures for what may be regarded as a fair sample of the general population.

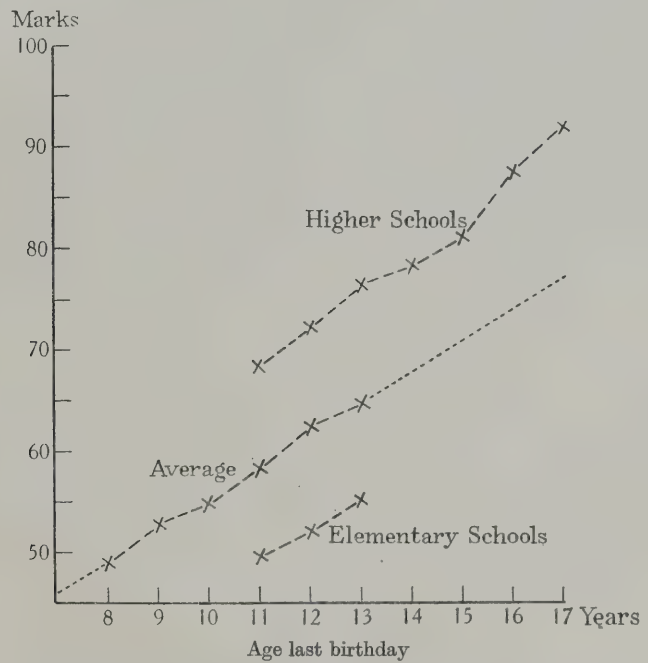
Fig. 1 shows the results so far obtained plotted in the form of 'growth curves'. It will be seen that the general course of development can be represented approximately by a straight line. For the total school population within the ages examined, the averages at each year might be expressed in terms of the following equation:

$$\text{Norm} = 3{\cdot}1\ \text{age} + 23.$$

To deduce the child's musical age from his mark in the tests we may employ the formula:

$$\text{Musical age} = \frac{\text{mark} - 23}{3{\cdot}1}.$$

If we calculate what may be called the musical quotient of the higher school children, we obtain $\frac{14{\cdot}6}{11{\cdot}5} = 127$ at $11\frac{1}{2}$, $\frac{16{\cdot}0}{12{\cdot}5} = 128$ at $12\frac{1}{2}$, $\frac{17{\cdot}1}{13{\cdot}5} = 127$ at $13\frac{1}{2}$, and (if we pool the remaining ages) $\frac{20{\cdot}0}{16{\cdot}0} = 125$ at 16.



Note. The prolongations of the curve for the 'Average' marks are based on the equation—mark = 3·1 age + 23.

Fig. 1. Development of musical ability with age

Similarly for the elementary children the average musical quotient at different ages keeps between the very narrow limits of 88 and 91. Thus, so far as our evidence goes, the musical quotient would seem to be remarkably constant.

This conclusion is confirmed by repeating the tests with individual children at intervals of a year or more. The musical quotients, obtained

on the two successive occasions, differ but little; the correlation between the two assessments amounts to 0·92.

VI. Summary

1. As a result of over 7 years' work, a large variety of tests for assessing musical ability and musical appreciation among school children have been devised, selected, and improved. For the main set of tests, seven in all, the necessary musical extracts have been recorded on gramophone discs. With the aid of roneo'd sheets they can be given in group form. In all nearly 4000 children and adults have been tested.

2. Factor analysis on the lines described by Burt has been applied both to correlations between tests and to correlations between persons. The results would seem to confirm the conclusions that he has put forward: they reveal (i) a *general factor* of musical ability common to all the tests and accounting for about 40 % of the total variance; (ii) a bipolar factor sorting the tests and the persons tested into two main types—*analytic* and *synthetic* respectively; (iii) a third factor sorting tests and persons into those depending mainly on *harmony* and on *melody* respectively. His further factor for the appreciation of *rhythm* (as distinct from that of melody and harmony) was not confirmed, but this was probably owing to the limitations of the test material.

3. In terms of these tests tentative norms are given for pupils aged 8–17 enabling the marks to be converted into terms of a musical age and a musical quotient. The course of development appears to be linear, and the musical quotient to be remarkably constant.

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PUBLICATIONS RECENTLY RECEIVED

Statistical Calculation for Beginners. By E. G. CHAMBERS. Cambridge University Press. 1940. Pp. viii + 110. 7*s.* 6*d.* net.

As its name implies, this is a book on the manipulation of statistical data, not a book on the theory of statistics which is relegated to the background. After dealing with averages and measures of dispersion the author goes on to a discussion of the normal distribution and the significance of the mean and of the difference between means of both large and small samples. Methods of calculating correlations and the significance of the difference between two correlations are then given, while partial correlation, biserial and four-fold correlation are also dealt with. The last two chapters are on regression and the correlation ratio and on contingency and goodness of fit.

It will be seen that the subject-matter includes all that is in general required by the ordinary research worker and student, so that the book provides them, though they may be without previous statistical training, with a tool by using which they can evaluate their results truly. Special features of the book are the numerous worked examples, the exercises (with answers) and the tables which lighten the arithmetical labour of computation.

There are a number of books dealing with the use of statistics on the market. This can be confidently recommended as one of the best. It is short and concise and within the competence of any ordinary non-mathematical person.

There are three slips which it may be desirable to point out for the benefit of anyone who may purchase the work and read this review: on p. 36, line 6, for "difference between the means" read "pooled observations"; line 9, add "between the means" after "differences"; p. 37, line 1, for "$\sqrt{1/N'}$" read "$\sqrt{N'}$." H. B.

An Analysis of Performance Test Scores of a Representative Group of Scottish Children. By GODFREY H. THOMSON. Publications of the Scottish Council for Research in Education, XVI. London: University of London Press. 1940. Pp. vii + 58. 5*s.* net.

This book presents a statistical analysis of the Binet and Performance test scores collected for the Scottish Council for Research in Education by Miss Macmeeken during 1935–7, when practically all the children born in Scotland on 1 February, 1 May, 1 August and 1 November 1926, were given these tests. A battery of eight performance tests was used. A Thurstone centroid analysis was made of all the data. A factor of general intelligence was first isolated; this was common to the Performance and Binet tests, and was therefore free of the verbal bias of the former, and from anything in the latter which is unrepresented in the Binet tests. A second factor in the Performance tests seemed to correspond to speed and rhythm of work. Two other factors were isolated, of doubtful psychological significance; but in view of the comments by Miss Macmeeken on the tests, one of them seemed to have some connexion with aesthetic satisfaction in test performance.

The statistical reader will no doubt find this monograph of great interest; but the more general psychological reader would have liked further information about the psychological nature of the Performance tests and the abilities they measure.

The Child and his Family. By CHARLOTTE BÜHLER. With the collaboration of E. BAAR, L. DANZINGER-SCHENK, G. FALK, S. GEDEON, G. HORTNER. London: Kegan Paul, Trench, Trubner & Co., Ltd. 1940. Pp. viii + 187. 10*s.* 6*d.* net.

The main importance of this book lies in its description of a new technique and method of child study. Certain middle class families in Vienna were selected for study; and these declared their willingness to receive trained psychological observers in their homes twice a week over periods of three to six months. The observers took part in all the normal activities of family life; and afterwards recorded in detail the behaviour of the selected children. The aim was to study accurately and in detail the child's relationships, and particularly parent-child and sibling relationships. Good reliability was shown when two different observers prepared records of the same events.

This method of collecting data appears to have been admirably conceived and carried out. But it is clear that such a study must depend for its interest and fruitfulness very largely upon the manner in which the data are systematized; and the treatment of the data appears much less satisfactory. The classification of the child and parent contacts is so involved as to be comprehensible only with difficulty. Dr Bühler and her collaborators have tried to make it objective, and though they recognize that attitudes and purposes must be taken into account in a study of contacts, yet only overtly expressed purposes are considered, and these again are classified into social, pedagogical, organizational, charitable and economic. The stress laid upon this overt and superficial aspect inevitably obscures their more important fundamental nature. Consequently the chapters on General Aspects of Parent Child Relationships and General Aspects of Sibling Relationships, which are devoted mainly to the working out of this classification, are neither lucid nor informative. The chapters on the Individual Families and the Individual Sibling Pairs give detailed descriptive accounts of families and siblings, illustrated by actual conversations and descriptions of behaviour. And from these we obtain a much clearer and better understanding of the nature of the children's relationships.

As Dr Bühler points out, the amount of material so far obtained is not sufficient to permit of any general conclusions being drawn. Data obtained from eight families, containing six fathers and mothers, and six sibling pairs, are presented in this book. The most interesting conclusions relate to the manner in which the children reflected in their sibling relationships, though with characteristic modifications, their parents' attitudes to them. This appeared particularly clearly in the attitudes and behaviour of the dominant child in each sibling pair.

We hope that it will be possible for Dr Bühler to extend the use of this most valuable new technique of child study, though if possible with some modifications in her method of classifying her data.

The Nature of Creative Activity. By VIKTOR LÖWENFELD. London: Kegan Paul, Trubner, Trench & Co., Ltd. 1939. Pp. xvii + 272. 76 illustrations in text, 78 Plates. 21*s.* net.

From a study of the drawings of weak-sighted individuals and of the modelling of the blind, the author deduces the existence of a 'haptic' type of artistic production, in which the individual expresses primarily his tactile impressions of objects and the muscular tensions accompanying emotional experiences. This 'expressionist' type of art, which is also natural to certain normal-sighted individuals, is contrasted with the 'impressionist' type, determined by visual impressions of the external environment. In general, the former seems to belong to an earlier stage of mental development than does the latter. Presumably this is because the young child is more immediately and

vividly aware of kinaesthetic and tactile percepts, so closely linked to his own body, than of visual percepts with their reference to a more remote and impersonal origin in the external environment.

In assessing children's artistic productions, it is undoubtedly useful to bear in mind the existence of this 'haptic' stage, and not judge the productions purely on the merits of their visual pleasingness or verisimilitude. It does appear, however, that the real importance of this stage lies in its relation to the other phenomena of development, fixation and regression, aspects which the author does not touch.

The illustrations are excellent, and so is the translation from the original German by O. A. Oeser. The title of the book is somewhat misleading.

Personality and Mental Illness. By JOHN BOWLBY. London: Kegan Paul, Trench, Trubner & Co., Ltd. 1940. Pp. xii + 280. 10*s.* 6*d.* net.

This book describes an attempt to work out a comprehensive classification, more satisfactory than existing ones, for psychotic and psychoneurotic types (the author denies the existence of any discontinuity between these). He claims that this can also be used for personality types in normal individuals. It is based, with certain modifications, on Kretschmer's schizoid-cycloid classification—the latter type the author, following Bleuler, prefers to call 'syntonic'. Each of these two 'genetic' types (as he maintains them to be) is subdivided into four or five 'personality sub-types', which cut across the existing psychotic and psychoneurotic classifications. Grouping is carried out in accordance with the possession of certain traits which the author has listed. Thirty-three of these (such as 'solitariness', 'aloofness', 'no sex', etc.) are considered to be characteristic of the schizoid type, though not occurring invariably in schizoids. The remaining seventy-two traits are commoner in syntones than in schizoids, but are not specific to the former.

As regards psychotics, this scheme appears to be valuable and to be based upon satisfactory clinical evidence. As regards psychoneurotics, it is less convincing, and the cases adduced in evidence rather few in number. And, as the author states, "normals may show so few traits that diagnosis is difficult", although "from casual observations of a number of acquaintances it has appeared to me that the majority of them do in fact approximate quite closely to one or other of the types described". Now all types based on patterns or groups of overt behaviour traits have an arbitrary appearance unless some underlying psychological structure or process can be shown to connect the isolated units of the group. The Freudian theory has done this by relating the various psychotic and psychoneurotic types to the degree of regression. The author rejects this theory, perhaps with justification; but in the absence of any other more satisfactory hypothesis, it is difficult to see in his scheme anything more than a neat arrangement of the more superficial aspects of the personality characteristics.

Analysis of Handwriting. By H. J. JACOBY. London: George Allen & Unwin, Ltd. 1939. Pp. 285 + 161 collotype illustrations. 10*s.* 6*d.* net.

This book gives a lucid account of the analysis of handwriting, with detailed descriptions of its characteristic features, and the interpretation of these in terms of the psychological characteristics and behaviour tendencies of the writer. The scheme of analysis is comprehensive and exhaustive, and the suggested interpretations most plausible, especially when those for different features of the handwriting are combined together to give a picture of the total personality, as in Part III, Chap. I. But how far are these interpretations valid? We are not given any evidence as to this. Instead of mentioning briefly how graphological interpretations have been utilized in various practical issues, vocational guidance, psychotherapy, criminology, etc., the author would have been better advised to adduce some reliable evidence of validity. Such evidence might have been obtained by use of the 'matching technique'—getting observers to 'match' the author's interpretations against case studies drawn up from

other independent sources. In the absence of some such procedure, the psychologist, though impressed by the author's apparently skilful use of graphology, must reserve his judgment as to its accuracy and usefulness.

Farbenproben sur Prüfung des Farbensinnes: 20., neu bearbeitete Auflage der *Stilling'schen Tafeln*. Von E. Hertel. English edition translated and edited by James Drever. Leipzig: Georg Thieme. 1939. Pp. 16+35 Plates. RM. 14–; 24*s*. 6*d*. net.

The new edition of Stilling's Tables contains the majority of the plates from the earlier series of tests for colour vision, but with an increased variety of numbers, letters and spectral ranges. But the $\mathscr{L}$ figures are not very legible for English readers. In addition plates have been added to show up the heightened sensitivity for brightness contrast which often accompanies colour defect. The instructions are clear and concise.

There is no doubt that these plates show admirably if colour defect exists or not. It would be interesting to have an accompanying scale of norms to give some indication of the extent of the colour defect.

The Psychology of Physics. By Blaney Stevens. Manchester: Sherratton & Hughes. 1939. Pp. xvi+282. 7*s*. 6*d*. net.

This book seems to be an attempt to provide a *philosophical* basis for physics. It is difficult to see why the word "psychology" should appear in the title.

The Foundations of Empirical Knowledge. By A. J. Ayer. London: Macmillan & Co., Ltd. 1940. Pp. vii+276. 10*s*. 6*d*. net.

PROCEEDINGS OF THE BRITISH PSYCHOLOGICAL SOCIETY 1940

GENERAL MEETINGS

APRIL 4–8, 1940. EXTENDED GENERAL MEETING AT BIRMINGHAM.

April 4.

1st Session:

Business Session, followed by a paper.

"Psychological Factors in Musical Composition and Improvisation." By J. MAINWARING. (Illustrated at the piano.)

April 5.

2nd Session: (Arranged by the Education Section.)

Business of the Section, followed by papers.

"Language Ability in Deaf Children." By ERNEST LUND.

Discussion on: "The Problems of Evacuated Children."

Speakers: E. M. BARTLETT, A. H. BOWLEY, C. PRESTON RAWSON.

(Afternoon.)

Visits to the Child Guidance Clinic, Edgbaston; the Juvenile Employment Department of the Birmingham Education Office; and the Medical School of the University.

3rd Session:

"Observations on Mosaic Tests." By C. L. C. BURNS.

"Guilt Reactions in Child Guidance Cases." By A. G. MCCLURE.

4th Session:

"The Clinical Uses of Mental Tests." By C. J. C. EARL.

"An Interpretation of some Children's Paintings." By M. S. M. FORDHAM.

5th Session:

"The 'Trivial' and 'Popular' in Psychology." By T. H. PEAR.

April 6.

6th Session:

"Education in Reasoning." By R. H. THOULESS.

Discussion on: "Propaganda."

Opening Speakers: REX KNIGHT and F. M. AUSTIN.

7th Session:

Inaugural Meeting of the Social Psychology Section.

Business, followed by a paper.

"Some Socio-Psychological Problems of Factory Life." By MARIE JAHODA.

8th Session:

"Some Causes of Juvenile Delinquency and Preventive Measures." By W. L. CHINN.

"Training Industrial Workers." By B. UNGERSON.

9th Session:

Discussion on: "So-Called War Neuroses."
Opening Speakers: Millais Culpin, T. A. Ross, Edward Glover.

April 7. 10th Session:

"Some Traits of Human Behaviour as Revealed by the Study of Brain Injuries." By K. Koffka.

11th Session:

"'Group Spirit'—Comparative Studies of the Formation of Homogeneous Social Attitudes in Small Groups." By O. A. Oeser.

12th Session:

Open Session for Discussion.

May 25, 1940. General Meeting (arranged by the Industrial Section) in London.
"A Critical Account of Public Opinion Measurement." By H. W. Durant.
"Individual Differences between Psychological Workers." By J. G. W. Davies.

July 6, 1940. General Meeting (arranged by the Social Psychology Section) at Oxford.
"Overlap of Social Movements." By J. C. Flugel (planned with Pryns Hopkins).
"Psychological Aspects of Environment—with special reference to Criminology." By M. Grünhut.
"Social Anthropology and Psychology." By A. R. Radcliffe-Brown.

December 14, 1940. Annual General Meeting in London.
Business, including Annual Reports.

SECTIONAL MEETINGS

Medical Section

January 24, 1940. "Study of a Dream." By Gerhard Adler.

March 13, 1940. Discussion on: "The Changes in our Psychic Economy caused by the War."
Principal Speakers: Edward Glover, H. G. Baynes, Karl Mannheim.

May 22, 1940. Discussion on: "Anorexia Nervosa."
Principal Speakers: S. W. Patterson (for Sir Edmund Spriggs), and W. Clifford M. Scott.

EDUCATION SECTION

March 16, 1940. (Nottingham.)
"Diagnosis of Personality Disturbance by means of the Binet Intelligence Scale." By M. E. HIGHFIELD.

April 5, 1940. 2nd Session, Extended General Meeting, at Birmingham.
(See under GENERAL MEETINGS, above.)

November 16, 1940. (Oxford.)
"Creative Imagination." By WM. STEPHENSON.
(A paper on "Musical Ability and Appreciation," by H. D. WING, was unavoidably cancelled.)

INDUSTRIAL SECTION

January 25, 1940. Discussion on: "Some Applications of Psychology in War Conditions."
Principal Speakers: MAY SMITH, H. M. VERNON, T. BEDFORD, MILLAIS CULPIN, ALEC RODGER.

February 15, 1940. "Individual Differences between Psychological Workers." By J. G. W. DAVIES.

May 25, 1940. Meeting of the Society, arranged by the Industrial Section.
(See under GENERAL MEETINGS, above.)

November 14, 1940. "Tests for Selecting Technical and Secondary School Children." By PATRICK SLATER.

December 12, 1940. "Work under Bombs." By CHRISTINE INNES.

SOCIAL PSYCHOLOGY SECTION

April 6, 1940. 7th Session, Extended General Meeting, at Birmingham.
INAUGURAL MEETING OF THE SECTION.
(See under GENERAL MEETINGS, above.)

July 6, 1940. Meeting of the Society, arranged by the Social Psychology Section, at Oxford.
(See under GENERAL MEETINGS, above.)

BRANCH MEETINGS

SCOTTISH BRANCH

Session 1939–40

November 18, 1939. (Glasgow.)
"Déjà Vu and the Unconscious." By R. W. PICKFORD.
"The Relationship between Foster Parent and Child." By LISELOTTE FRANKL.
"Psychological Problems of Evacuation." By A. H. BOWLEY.

February 3, 1940. (Edinburgh.)
"Work in progress in some American Universities: an informal review and discussion." By O. A. OESER.
"Colour Sense in Insects." By DORA ILSE.

March 9, 1940. (Glasgow.)
"Some Medico-Psychological and Legal Aspects of Crime." By A. MACNIVEN.
"Examination Anxiety." By J. D. SUTHERLAND.

May 4, 1940. (Edinburgh.)
"Recent Experiments on the Perception of Music." By P. E. VERNON.
"Three Group Tests of Intelligence and I.Q.s for Adults." By B. BABINGTON SMITH.

MIDLAND BRANCH.

February 29, 1940. (Birmingham.)
"Individual Psychology." By Dr PLEWNER, of Vienna.

April 4–8, 1940. Extended General Meeting of the Society, at Birmingham. (Arranged with the co-operation of the Midland Branch.)
(See under GENERAL MEETINGS, above.)

June 1, 1940. (A meeting arranged to be held at Leicester was unavoidably cancelled.)

NORTHERN BRANCH.

Note. Owing mainly to travel difficulties and war-time duties, it was found impossible to hold meetings during the year. Members were circularized and the Branch remains in being.

STATEMENT ON THE FUNCTIONS OF THE NATIONAL SERVICE COMMITTEE FOR SOCIAL, ECONOMIC AND STATISTICAL RESEARCH

NATIONAL SERVICE COMMITTEE FOR SOCIAL, ECONOMIC AND STATISTICAL RESEARCH

THE Schedule of Reserved Occupations does not make any provision for Economists or workers in the other Social Sciences, who are not whole time members of University staffs, nor does the reservation of Statisticians at thirty completely meet the need for retaining qualified men for work of national importance who may be under thirty. While there is no intention of including these classes in the Schedule, the Minister of Labour and National Service has provided machinery for dealing with them. At his invitation a Committee, called the National Service Committee for Social, Economic and Statistical Research, has been set up to consider the cases of men of military age who are highly qualified for research work in Statistics, Economics and the Social Sciences. The function of the Committee is to make recommendations to the Ministry of Labour in order that the calling up of such men may be deferred. The Committee consists of representatives of the National Institute of Economic and Social Research, of the Royal Economic Society and of the Royal Statistical Society.

There are two categories in which the Committee may place cases:

Category A. Cases of men identified as Scientific Research Workers, either as Statisticians, Economists or Social Science Research Workers. "Identification" is taken to mean "certification of scientific status" and is dependent upon the qualifications of knowledge and experience in the appropriate research techniques. Where men are placed in this category indefinite deferment of calling-up is usually granted by the Ministry. This is conditional upon such cases passing successfully before the Committee at six-monthly intervals for review. On review evidence of occupation must be submitted so that the Committee may certify that the men in question are engaged wholetime in appropriate occupations of statistical, economic, or social science research work.

Category B. Cases of men who should, from the point of view of the public interest, remain at any rate for a time upon the work in which they are already engaged as statisticians, economists or social science research workers. Recommendations are made for given periods of

deferment of calling-up and these may sometimes be made for the specific purpose of allowing time for training a substitute. These two categories are mutually exclusive and the requirements of *A* are more stringent than those of *B*.

The age limits are 25–42 years in the case of Economists and Social Science Research workers, 25–29 in the case of Statisticians. The only permissible exception would be a case of an exceptionally well-qualified and valuable statistician who is under 25.

Direct application can be made to the Committee either by the man himself on his own behalf or by the organization for which he is working. Applicants can state for which category they wish the case to be considered. Where a man applies on his own behalf for inclusion in Category A, the Committee welcomes supporting testimonials from authorities in the scientific field in which he has worked. Where application is made for inclusion in Category B, it should as a rule be supported by a government department interested in the work. All applications should give clear and adequate details of qualifications, research and other relevant experience, and of present occupation.

All whole time members of University staffs engaged in Social, Economic and Statistical research should apply in the first place to their University authorities to find out whether their cases come within the scope of the arrangements for dealing with University staff who are not covered by the Schedule.

All enquiries and requests for application forms should be sent to the Secretary, National Service Committee for Social, Economic and Statistical Research, 6 Duke of York Street, London, S.W.1.

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